UGANDA PROTECTORATE.

◆

ANNUAL

MEDICAL AND SANITARY REPORT

FOR THE

YEAR ENDED 31ST DECEMBER, 1917.

Published by Command of His Excellency the Governor.

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THE PRINCIPAL MEDICAL OFFICER'S OFFICE,
ENTEBBE, UGANDA,
31st May, 1918.

SIR,

I have the honour to submit, for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State, the Medical Report on the health and sanitary condition of the Uganda Protectorate for the year 1917, together with the Returns, etc., appended thereto.

I have the honour to be,
Sir,
Your obedient servant,

C. A. WIGGINS,
Acting Principal Medical Officer,
Uganda Protectorate.

THE CHIEF SECRETARY
TO THE GOVERNMENT,
UGANDA PROTECTORATE.

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UGANDA PROTECTORATE.

ANNUAL MEDICAL REPORT

FOR THE

YEAR ENDED 31ST DECEMBER, 1917.

SECTION I.

ADMINISTRATIVE.

(A) Medical Staff.

(1) The Sanctioned Establishment for the Medical Staff was :—

EUROPEAN:

Principal Medical Officer.
Deputy Principal Medical Officer.
Medical Sanitary Officer.
2 Senior Medical Officers.
14 Permanent Medical Officers.
1 Bacteriologist.
1 Medical Officer of Health.
9 Temporary Medical Officers.
1 Dental Surgeon.
1 Matron
2 Nursing Sisters.
2 European Dispensers.
1 European Sleeping Sickness Inspector.
1 Laboratory Assistant.

ASIATIC:

1 Assistant Surgeon.
19 Sub-Assistant Surgeons.
7 Compounders.

NATIVE:

A varying number of Native Attendants including:—

Hospital and Dispensary Dressers, etc.
Isolation Hospital and Camp Attendants, etc.
Native Vaccinators.
Plague Inspectors.
Sleeping Sickness Inspectors.
Menial Staff.

(2) The Shortage on Establishment during the year consisted of :—

1 Permanent Medical Officer (restored to active list of the army) for whole year.
3 Temporary Medical Officers for whole year.
1 Sub-Assistant Surgeon do do
1 Compounder for 11½ months.
1 Compounder from 24th June to end of year.

In addition to the above a large proportion of the European and Asiatic Staff were engaged on military duty outside the Protectorate, *See* para (5).

(3) The Clerical Staff at Headquarters remained the same as in 1916, *viz.:*—

EUROPEAN:

Chief Clerk to the Principal Medical Officer.
Assistant Clerk.
Medical Storekeeper.

ASIATIC:

1 Third Grade Clerk.
2 Fourth Grade Clerks.

AFRICAN:

1 Native Clerk.

(4) List of Appointments, Changes, etc., in Staff.

From England—Relief Nursing Sister D. K. Freear.

From India—Compounder R. K. Raval.

Secondments—Dr. J. Currie was seconded from Nigeria for temporary duty with effect from 2nd April, 1917, but he has not served in Uganda. He was seconded directly he arrived for service in Conquered Territory (Mwanza).

Sub-Assistant Surgeon Hukam Singh remained seconded to the East Africa Protectorate and Sub-Assistant Surgeon Karta Ram from East Africa Protectorate throughout the year, both for military duty.

Transfers—Sergeant C. Chorley, U.M.S., from German East Africa to act as Medical Storekeeper, Entebbe, from 20th October, 1917.

Promotions—Nil.

Resignations—Dr. R. J. A. Macmillan who re-joined his British Military Unit.
Dr. F. C. Doble.

Retirement—Sub-Assistant Surgeon Fateh-ud-Din retired on pension.

Termination of agreement—Compounder Mela Ram terminated his agreement on 24th March, 1917.

Invalidings—Nil.

Deaths—Nil.

Leaves—The following were on leave during the periods stated opposite their names :—

	From	*To*
Dr. A. C. Rendle	6th August, 1917 ...	end of year
Dr. J. H. Reford	18th September, 1917 ...	end of year
Dr. C. H. Marshall	5th April, 1917 ...	end of year
Dr. R. E. McConnell	30th January, 1917 ...	end of year
Dr. F. C. Doble	10th April, 1917 ...	3rd November, 1917 (Date of resignation)
Dr. R. J. A. Macmillan	1st January, 1917 ...	7th January, 1917 (re-joined British Military Unit.)
Dr. W. L. Webb	16th December, 1917 ...	end of year
Dr. N. S. Williams	25th June, 1917 ...	end of year
Dr. R. S. Taylor	1st January, 1917 ...	22nd August, 1917
Nursing Sister A.B. Gordon	16th December, 1917 ...	end of year
Mr. H. Flint, Chief Clerk	23rd February, 1917 ...	13th December, 1917
Mr. H. G. Blackman, Medical Storekeeper.	11th November, 1917 ...	end of year
Mr. J. Stewart, Laboratory Assistant ...	5th May, 1917 ...	end of year
Mr. C. W. V. Gittins, S. S. Inspector ...	24th January, 1917 ...	5th November, 1917
Sub-Assistant Surgeon A. D. Karkhanis ...	18th January, 1917 ...	15th September, 1917
Sub-Assistant Surgeon Achru Ram ...	20th May, 1917 ...	25th September, 1917
Sub-Assistant Surgeon M. Barkatullah ...	5th December, 1917 ...	31st December, 1917
Compounder Faquir Chand	18th January, 1917 ...	22nd November, 1917
Compounder Mela Ram	1st January, 1917 ...	24th March, 1917
Compounder E. F. X. Fernandes ...	11th November, 1917 ...	31st December, 1917

Of the above Dr. A. C. Rendle retires on a pension on completion of his leave, while Dr. N. S. Williams, whose leave expires 2nd January, 1918, and Mr. H. G. Blackman, are not returning to this Protectorate.

In spite of the long list of those who went on leave during 1917, the great majority of the staff was overdue for leave on 1st January, 1918, some Medical Officers having been out over 5 years without a break. Unfortunately owing to the serious shortage of staff and the difficulty experienced in filling vacancies, it is impossible to allow them to proceed on leave even now. It is hoped, however, that Major H. B. Owen, Captains A. H. Owen, G. D. H. Carpenter and H. L. Duke will be released from military duties during 1918 and be enabled after a few months' leave to replace those who have been out the longest and who really are in need of home leave.

(5) MEDICAL OFFICERS AND MEMBERS OF THE SUBORDINATE STAFF ENGAGED ON MILITARY DUTY DURING 1917.

Engaged solely on Military Duty outside the Protectorate:—

(a) EUROPEANS:

	From	*To*
Dr. J. Currie, S.M.O., W.A.M.S.	24th July, 1917	end of year
Dr. J. H. Reford ...	1st January, 1917	26th July, 1917. *Proceeded on leave.*
Dr. C. H. Marshall ...	1st January, 1917	27th February, 1917. *Proceeded on leave.*
Dr. H. B. Owen, D.S.O. ...	... The whole year	
Dr. G. D. H. Carpenter ...	... The whole year	
Dr. R. E. McConnell ...	1st January, 1917	15th January, 1917. *Proceeded on leave.*
Dr. H. L. Duke, Bacteriologist	The whole year	
Dr. A. H. Owen	... The whole year	
Captain G. J. Keane, D.S.O., R.A.M.C.	... The whole year	
Dr. W. L. Peacock ...	... The whole year	
Mr. F. E. Westray, Dispenser	... The whole year	

(b) ASIATICS:

Sub-Assistant Surgeon Hukam Singh ...	The whole year. *Seconded for service to E.A.P.*	
Sub-Assistant Surgeon Karta Ram ...	The whole year. *Seconded for service from E.A.P.*	
Sub-Assistant Surgeon Basant Singh ...	The whole year	
Sub-Assistant Surgeon Ram Chand ...	The whole year	
Sub-Assistant Surgeon B. P. Das	1st January, 1917	13th January, 1917
Compounder Ahmed Din	The whole year	
Compounder Ghulam Haider	1st January, 1917	1st March, 1917

Engaged on Civil and Military Duty in the Protectorate:—

(a) EUROPEANS:

	From	*To*
Dr. A. D. P. Hodges, C.M.G., P.M.O. ...	The whole year	
Dr. C. A. Wiggins, D.P.M.O. ...	The whole year	
Dr. G. C. Strathairn, S.M.O. ...	The whole year	
Dr. J. H. Goodliffe	The whole year	
Dr. J. A. Taylor	1st January, 1917	7th November, 1917
Dr. B. Spearman ...	7th November, 1917	31st December, 1917
Dr. H. R. Neilson	The whole year	
Miss B. Petherbridge, Matron ...	The whole year	
Miss E. M. Pratt, Nursing Sister ...	The whole year	
Mr. H. G. Blackman, Medical Storekeeper.	1st January, 1917	19th October, 1917. *Proceeded on leave.*

(b) ASIATICS:

Assistant Surgeon B. T. Thadani ...	The whole year	
Sub-Assistant Surgeon M. Barkatullah ...	1st January, 1917	5th December, 1917
Sub-Assistant Surgeon Achru Ram ...	1st January, 1917 26th Sept., 1917	1st May, 1917 end of year
Sub-Assistant Surgeon J. J. Bhatt ...	The whole year	
Sub-Assistant Surgeon Mangal Sain ...	The whole year	
Compounder E. F. X. Fernandes ...	1st January, 1917	21st October, 1917

The Clerical Staff at the Headquarter Office and Store have throughout performed military duty in addition to their civil duties.

(B) Financial.

The estimated expenditure of the Medical Department for the year 1917-1918 was as follows:—

	£	
Personal Emoluments.—		
Principal Medical Officer and Deputy Principal Medical Officer	1,550	
Clerical Staff, Medical Storekeeper, Packers, Messengers, etc.	1,079	
Permanent Medical Officers	8,091	
Temporary Medical Officers and Subordinate Staff for the suppression of Sleeping Sickness	1,550	
Temporary Medical Officers and Subordinate Staff for dealing with Venereal Diseases	1,875	
Temporary Medical Officers and Subordinate Staff for dealing with Epidemic Diseases	1,894	
Dental Surgeon	440	
Sanitation.—		
Medical Sanitary Officer and Medical Officer of Health	1,190	
Laboratory Division.—		
Bacteriologist	550	
Subordinate Staff	200	
Total Personal Emoluments		£ 18,419
Other Charges.—		
For Anti-Malarial Measures (petty)	500	
For the suppression of Sleeping Sickness	1,950	
For dealing with Venereal Diseases	50	
For dealing with Epidemic Diseases	1,850	
Special Plague Expenditure	250	
Miscellaneous Charges	2,670	
Total Other Charges		£ 7,270

HOSPITALS AND DISPENSARIES.

Personal Emoluments.—		
Nursing Staff	715	
Dispensers	440	
Indian Medical Assistants	2,730	
Native Attendants	740	
Miscellaneous Allowances	10	
Total Personal Emoluments		£ 4,635
Other Charges.—		
Medical and Surgical Stores	2,500	
Up-keep and Equipment of Hospitals	1,050	
Up-keep and Equipment of Laboratory	180	
Miscellaneous Charges	763	
Total Other Charges		£ 4,493

TOTAL CHARGES:—

Personal Emoluments	23,054	
Other Charges	11,763	
Total		£ 34,817

The estimated Revenue for 1917-1918 was £105.

SECTION II.

PUBLIC HEALTH.

(A) Vital Statistics.

Table IIIA shows the Deaths under 23 main headings as returned by the Native Chiefs in the 5 Districts from which returns are sent in. The Births and Still-Births are also given in the last 2 columns of the table.

Table IIIB shows the Births and Deaths for the same 5 Districts for the last 5 years.

Table IIIC shows Native Populations, Births, Deaths and rates per 1,000, for Provinces or Districts from which returns made, and percentage of still-births to total births.

These tables show a most unsatisfactory state of affairs. The returns may not be very accurate as to diagnosis but are probably not far wrong as regards the totals of births and deaths.

It is seen that in Bunyoro the Births have dropped from 5,527 in 1913 to 1,680 in 1917 (and including Still-Births from 7,559 to 2,486) and though a good deal of this may be put down to emigration yet this is not the only cause. The Banyoro are a very poor race physically and syphilis is probably the chief cause of the small number of births and the large number of still-births. It is reported that inoculation of infants with syphilis is still practised.

In Buganda the Deaths, according to the returns, outnumber the Births in each year, but in 1917 they were nearly half as many again.

Toro also shows a large decrease in Births. According to the returns the proportion of still-births is very high though it varies considerably in the various districts: thus in Busoga 1 is still-born to every 16 born alive, in Buganda 1 to 9, Ankole 1 to 8, Toro 1 to 3 and Bunyoro 1 to 2.

The deaths of women from child-birth, however, show a welcome reduction, thus in 1917 there were only 765 returned as against 1,448 in 1913.

From Table IIIA it will be seen that except for 'Fever' and 'Chest Complaints' (both of which terms include many diseases), Syphilis is responsible for the greatest number of deaths. The special work in connection with venereal diseases was, unfortunately, unavoidably stopped at the beginning of the war by the removal of the greater part of the Medical Staff for military service, but the above tables show the pressing need for a large increase in the medical staff of the Protectorate and a resumption of an active campaign against Venereal Diseases even apart from the occurrence of epidemic diseases.

TABLE IIIA.—TABLE OF DEATHS FOR THE FIVE DISTRICTS OF BUGANDA, BUSOGA, BUNYORO, ANKOLE AND TORO FOR THE YEAR 1917.

CAUSE OF DEATH.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
COUNTY.	C. S. M.	Fever.	Sleeping Sickness.	Plague.	Small-pox.	Measles.	Syphilis.	Gonorrhœa.	Dysentery.	Diarrhœa.	Leprosy.	Cancer.	Tuberculosis.	Muhinyo or Bihimbo.	Dropsy.	Chest Complaints.	Fits.	Paralysis.	Abscess.	Wounds and Injuries.	Snake bite.	Child-birth	Other Causes	Total Deaths.	Total Births.	Still-Births.
Buganda	—	3,361	—	238	569	17	760	1,042	107	215	105	222	421	381	71	1,478	65	873	68	38	35	166	2,971	13,203	8,818	971
Busoga	—	338	118	518	1,199	249	557	342	260	418	115	110	35	337	124	909	66	578	110	9	55	299	2,146	8,892	11,132	726
Bunyoro	246	90	8	18	191	5	84	178	103	159	16	69	130	107	53	549	33	158	23	10	22	56	818	3,126	1,680	806
Ankole	244	1,690	84	201	16	43	534	45	98	92	23	151	171	514	46	151	47	107	17	19	18	164	882	5,357	6,214	763
Toro	—	89	4	48	2	6	151	73	13	14	12	31	57	223	62	160	14	19	13	21	15	80	339	1,446	3,029	1,211
TOTAL ...	490	5,568	214	1,023	1,977	320	2,086	1,680	581	898	271	583	814	1,562	356	3,247	225	1,735	231	97	145	765	7,156	32,024	30,873	4,477

Sleeping Sickness Camps—March and November 2.

TABLE IIIB.—NATIVE POPULATIONS.—BIRTHS, DEATHS AND RATES PER 1,000, FOR PROVINCES OR DISTRICTS FOR WHICH RETURNS MADE, AND PERCENTAGE OF STILL-BIRTHS TO TOTAL BIRTHS.

1917.	BUGANDA.		BUSOGA.		BUNYORO.		ANKOLE.		TORO.		TOTAL.	
Population.	670,252		255,686		106,143		267,565		111,757		1,411,403	
	Births (living).	Deaths.	Births (living).	Deaths.	Births (living).	Deaths.	Births (living).	Deaths.	Births (living).	Deaths.	Births (living).	Deaths.
	8,818	13,203	11,132	8,892	1,680	3,126	6,214	5,357	3,029	1,446	30,873	32,024
Rates per 1,000.	13·29	19·69	43·54	34·78	15·83	29·46	23·22	20·02	27·11	12·94	21·87	22·69
Still-Births per cent of Total Births and Still-Births.	971 = 9·91 per cent.		726 = 6·12 per cent.		806 = 32·42 per cent.		763 = 10·93 per cent.		1,211 = 28·55 per cent.		4,477 = 12·66 per cent.	

TABLE IIIc.—BIRTHS AND DEATHS FOR THE FIVE YEARS 1913—1917 FOR BUGANDA, BUSOGA, BUNYORO, TORO AND ANKOLE.

	1913.			1914.			1915.			1916.			1917.			Total Births 1913—1917.	
	B.	S.B.	D.	B.	S.B.	D.	B.	S.B.	D.	B.	S.B.	D.	B.	S.B.	D.	Male	Female
Buganda ...	8,971	925	11,989	9,061	976	10,949	8,319	978	12.231	9,737	968	12,802	8,818	971	13,203	22,607	22,299
Busoga ...	10,992	611	7,870	9,470	360	7,770	9,634	480	7,228	12,093	548	7,771	11,132	726	8,892	27,270	26,051
Bunyoro ...	5,527	2,032	6,019	4,737	1,566	4,852	3,081	1,217	3,043	1,763	841	2,280	1,680	806	3,126	8,044	8.744
Toro ...	5 156	2,056	2,397	3,933	1,659	1,729	3,739	1 391	1,474	3,509	1,473	1,645	3,029	1,211	1,446	9,538	9,828
Ankole ...	5,638	681	4,241	5,863	622	4,290	5,577	711	5,434	5,877	787	5,079	6,214	763	5,357	13,677	15,492
TOTAL ...	36,234	6,305	32,516	33,064	5,183	29,590	30,350	4,777	29,410	32,979	4,617	29,577	30,873	4,477	32,024	81,136	82,414

B = Births.
S.B = Still-Born.
D = Deaths.

(B) General Remarks.

The general health for 1917 cannot be considered as anything but unsatisfactory.

2. Epidemics of Cerebro Spinal Meningitis and Smallpox have been very widely spread during the latter part of the year especially in the Northern and Eastern Provinces and it is impossible to estimate accurately the number of deaths in the outlying districts. The Medical Officer, Gulu, estimates that at least 5,000 natives have died of Cerebro Spinal Meningitis alone in the area under his charge, *i.e.*, West Nile, Gulu and Kitgum during 1917, while the District Commissioner, West Nile, estimates 3,000 in the West Nile alone. The large increase in epidemic diseases is undoubtedly chiefly due to the war owing firstly to the large increase in the movements of the native population, *e.g.*, recruiting for King's African Rifles, secondly to the shortage of Medical Staff. Even in pre-war times (with 23 Medical Officers) our staff has never been sufficiently numerous to attempt to cope with diseases in the more distant parts of any district, for a Medical Officer becomes each year more and more tied by his routine duties to his station, but during 1917 the staff has been reduced to such a very small number both as regards Medical Officers (7 only) and Indian Assistants, that it has been impossible to do all that should have been done.

3. Another factor in the spread of smallpox has been the inefficiency of the vaccine lymph. We have used more in 1917 than in any year before, except 1915, mostly from the Nairobi Laboratory, but, though 60% of the vaccinations of which the result was known were apparently successful, the protection given has been unfortunately, very slight, if any.

4. Cerebro Spinal Meningitis and Smallpox have increased, too, in our 3 most important townships Entebbe, Kampala and Jinja, though Plague has shown a considerable decrease in Kampala and Jinja. The difficulty of dealing with epidemics in these townships successfully is greatly increased by the fact that we have no adequate isolation hospitals or segregation camps at either place. *See* page 20. The following table shows the number of cases of Plague, Cerebro Spinal Meningitis and Smallpox occurring in Entebbe, Kampala and Jinja for the 5 years 1913—1917.

TABLE A.

		PLAGUE.					CEREBRO SPINAL MENINGITIS.					SMALLPOX.				
		1913	1914	1915	1916	1917	1913	1914	1915	1916	1917	1913	1914	1915	1916	1917
ENTEBBE.	Cases ..	..	..	..	2	36	2	..	1	18	14	..	..	41	8	16
	Deaths..	..	..	..	1	33	1	..	1	7	7	..	..	4	4	3
KAMPALA.	Cases ..	..	..	..	238	122	1	..	..	21	141	..	..	46	40	331
	Deaths..	..	..	..	216	110	1	..	..	13	106	..	..	9	9	67
JINJA.	Cases ..	..	23	1	62	8	1	5	1	18	4	1	47	41	24	113
	Deaths..	..	14	1	54	7	1	4	1	15	4	..	..	14	7	30
TOTALS	Cases ..	..	23	1	302	166	4	5	2	57	159	1	47	128	72	460
	Deaths..	..	14	1	271	150	3	4	2	35	117	..	..	27	20	100

5. The impossibility of treating satisfactorily 122 cases of plague, 141 of cerebro spinal meningitis and 331 of smallpox at Kampala during 1917 without a building of any kind beyond temporary huts is evident and the importance of providing adequate accommodation both for infectious cases and contacts for Entebbe, Kampala and Jinja cannot be over estimated.

6. The need of a Bacteriologist has been more felt during this last year than ever before. We have had one on our staff list for 4 years but ever since his appointment we have been without his services and the Laboratory has never been opened owing to his being on military duty as a Medical Officer in German East Africa. Apart from smallpox lymph we need other vaccines and serums in large quantities, *e.g.*, for dealing with cerebro spinal meningitis, plague, etc.

The number of cases treated at the various Government Hospitals and Dispensaries shows a decrease from 75,537 with 553 deaths in 1916 to 70,236 with 967 deaths in 1917. This total does not include the cases treated at the Military Hospitals at Bombo, Entebbe and Gulu; these are shown separately in Table VIIb, but unless specially mentioned are not otherwise included in this report.

COMMUNICABLE DISEASES.

The total number of communicable diseases was 16,444 in 1917 as against 17,695 in 1916. The most important increases are (1) Cerebro Spinal Meningitis from 71 with 42 deaths to 469 with 347 deaths, (2) Smallpox from 104 with 25 deaths to 992 with 230 deaths, giving a death rate of just over 23%.

The most important decreases are (1) Dysentery from 827 with 19 deaths to 498 with 44 deaths, (2) Plague from 321 with 283 deaths to 171 with 143 deaths and (3) Malaria from 5,675 with 10 deaths to 4,414 with 6 deaths.

1. MOSQUITO OR INSECT BORNE.

Malaria.—That the number of cases of Malaria has actually decreased to the extent shown in the preceding paragraph cannot be vouched for, for the majority of the cases have not been verified by microscopical examination and the diagnosis at many stations is that of Indian Sub-Assistant Surgeons or Compounders.

As regards Europeans at Entebbe, where all cases are verified by the microscope, there was a decrease from 84 cases in 1916 to 35 in 1917.

Blackwater Fever.—46 cases were treated at Government Hospitals and Dispensaries with 7 deaths while 3 cases with 1 death were treated at the Church Missionary Society's Hospital. Of the 46 cases, 8 were Europeans. Of these 2 were fatal. The remainder were Asiatics.

The cases were spread throughout the Protectorate, thus there were 16 at Kampala, 10 at Jinja, 5 at Soroti, 4 each at Entebbe and Namasagali, 2 each at Gulu, Lira, Masindi and Mbale and 1 each at Hoima and Masaka. (The 2 cases at Gulu were of the same man, with a history of 7 previous attacks).

A death rate of only 16·3% may be considered as most satisfactory as many of the cases were not hospital cases and had no nurse.

The following table shows the number of cases of Blackwater Fever recorded in the Protectorate since 1904:—

Year.	*Cases.*	*Deaths.*	*Year.*	*Cases.*	*Deaths.*
1904	10	2	1911	18	3
1905	14	3	1912	45	9
*1906	41	4	1913	58	12
1907	10	2	1914	82	21
1908	13	2	1915	65	18
1909	21	6	*1916	46	10
1910	26	6	1917	49	8

*Exceptionally heavy rainfall in these years.

Dengue.—6 cases were recorded, 5 at Kampala and 1 at Entebbe, as against 2 in 1916.

Yellow Fever.—Unknown in Uganda.

Elephantiasis. —The number of cases and deaths is not known as diseases of the Lymphatic System and Connective Tissue are not shown in detail in the returns for this year.

Relapsing Fever.—105 cases were returned with 7 deaths as against 148 with 1 in 1916. The decrease is due mostly to the Masaka figures which showed 49 instead of 106. Notes on a remarkable case in a European are published as an Appendix (6) to this Report.

Trypanosomiasis.—(Sleeping Sickness). The admissions during the year were 19 with 5 deaths, including 2 deaths at Kyetume Camp. In 1916 the figures were 17 with 10 deaths. These cases occurred at the following stations.—Gulu 7, Jinja 5, Lira 5, Mbale 1 and Mbarara 1.

There has been no special investigation nor inspection work by Medical Officers during the year owing to the shortage of staff but the usual clearings, boundaries, ferries, etc. have been maintained and controlled by the Native Inspectors under the Administrative Officers.

As will be seen by the following table (B) 229 deaths were returned for the whole Protectorate. The continued occurrence of so large a number of cases in Busoga and Ankole will be investigated directly a Medical Officer can be spared for the purpose.

TABLE B.—SHOWING THE DISTRIBUTION OF DEATHS ATTRIBUTED TO SLEEPING SICKNESS IN COMBINED NATIVE AND OFFICIAL RETURNS SINCE 1905:—

Year.	PROVINCES OR DISTRICTS.							
	Buganda.	Busoga.	Bunyoro.	Ankole.	Toro.	Nile Province.	County Unknown.	Totals.
1905	8,003	No record	No record	No record	No record	No record	No record	8,003
1906	5,304	849	369	—	—	—	—	6,522
1907	3,407	593	170	—	—	5	—	4,175
1908	1,723	1,478	461	—	—	—	—	3,662
1909	925	603	254	—	—	—	—	1,782
1910	527	698	277	37	—	7	—	1,546
1911	253	1,013	168	6	46	1	—	1,487
1912	82	747	84	11	5	—	3	932
1913	57	554	41	21	29	—	6	708
1914	24	354	15	65	8	—	—	466
1915	3	244	11	88	4	2	—	352
1916	2	155	7	37	8	—	—	209
1917	—	118	8	84	4	13	2*	229
TOTALS ...	20,310	7,406	1,865	349	104	28	11	30,073

* In Sleeping Sickness Camp.

It will be seen that no cases and no deaths were attributed to Sleeping Sickness in Buganda Kingdom during the year.

In November it was decided to reduce the prohibited area around the Victoria Nyanza, in the Buganda Kingdom only, from a 2 mile zone to 1 mile, and by the end of the year a great part of this was marked out by flags and the new boundary demarcated.

Small areas in the prohibited area on the Entebbe peninsula have also been re-opened for occupation by natives.

2. INFECTIOUS OR EPIDEMIC DISEASES.

Beri-Beri.—Nil.

Cerebro Spinal Meningitis.—The admissions during the last 3 years have been as follows:—

1915 ... 4 cases with 3 deaths.
1916 ... 71 ,, ,, 42 ,,
1917 ... 469 ,, ,, 347 ,, 74%

In addition to the above figures for 1917 the Military Hospitals admitted the following numbers:—

Bombo ... 170 cases with 113 deaths.
Entebbe ... 14 ,, ,, 9 ,,
Gulu ... 41 ,, ,, 20 ,,

TOTAL ... 225 cases with 142 deaths.

The disease was very widely spread, every station except Masaka returning cases The largest numbers were reported at Hoima 161, and Kampala 141. The death rate is high but this has been unfortunately unavoidable. The lack of suitable accommodation for infectious cases and the shortage of staff has made the routine treatment by Lumbar puncture impossible. It must also be remembered that the above figures include only the worst cases as the majority do not come up for treatment.

This disease is the most formidable one we have to deal with. The figures above give no idea of the extent to which the Protectorate has suffered especially in the North and North Eastern districts, *viz.*:—West Nile, Gulu, Kitgum and Lango. The Administrative Officers have helped us considerably and it is hoped that the Natives are now beginning to realise the dangers of the universal practice of 'visiting' from an infected village to a healthy one, but as mentioned above adequate medical control or supervision has been impossible. There was no Medical Officer and no Medical Assistant in the West Nile or Kitgum district throughout the year and only 1 Medical

Officer and 1 Indian Assistant at Gulu and 1 Indian Assistant at Lira, (after July) for the whole of the 4 above-named districts with a population of considerably over half a million.

Dysentery.—There was a welcome decrease during the year the figures being 498 with 44 deaths as against 827 with 19 deaths in 1916. The native death returns also show a decrease from 818 to 581.

Enteric.—*Vide* special report already submitted. This is printed as Appendix (2) to this Report.

Erysipelas—3 cases were treated during the year as against 2 in 1916.

Gonorrhœa.—The figures for 1917 were 1,645 with 2 deaths as against 1,863 with 3 deaths in 1916. The special treatment rooms were closed throughout the year.

Influenza.—Only one case was reported.

Leprosy.—10 cases were recorded, 6 nodular and 4 anæsthetic, as against 14 in 1916. In the one Leprosy Camp at Vugamira (for Busiro County) there were 32 cases on December 31st, 1917.

Measles.—70 cases were returned, an increase of 56 over the 1916 figures; of these 23 were at Kampala. The native returns also show a considerable increase in the number of deaths from this cause, namely 320 instead of 130.

Undulant (Malta) Fever.—Only 1 case, which was fatal, was returned. There were 3 in 1916. The native figures show a slight increase in the number of deaths attributed to 'Muhinyo,' 1,562 as compared with 1,504 in 1916.

Plague.—The admissions for plague show a considerable decrease during the year being 171 with 143 deaths as against 321 with 283 deaths in 1916.

The cases at Entebbe, Jinja and Kampala have already been alluded to, *see* Table A. There is also a slight decrease in the number recorded by the Native Chiefs and Inspectors, *see* Table C below. But in the thickly populated districts of Bukedi, Teso and Lango there was unfortunately a considerable increase in the last two months of the year, *see* Table D below. (It is possible some of these may be due to Cerebro Spinal Meningitis.)

TABLE C.—SHOWING THE NUMBER OF DEATHS ACCORDING TO NATIVE RETURNS (AND RETURNS BY NATIVE INSPECTORS IN THE EASTERN PROVINCE) DURING THE LAST FIVE YEARS.

DISTRICT.	1917	1916	1915	1914	1913
Buganda	238	220	227	340	568
Busoga	518	462	273	88	468
Bukedi	1,661	2,562	1,912	1,963	1,671
Teso	594	458	615	651	261
Lango	753	627	951	624	222
Bunyoro	18	17	4	4	40
Toro	48	4	2	21	—
Ankole	201	34	44	34	62
Nile		*no*	*returns.*		
TOTALS ...	4,031	4,384	4,028	3,725	3,292

TABLE D.—SHOWING THE NUMBER OF DEATHS FROM PLAGUE IN THE BUKEDI, TESO AND LANGO DISTRICTS, 1917.

(Native Inspector's returns.)

District	Jan.	Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	TOTALS
Bukedi	163	158	162	109	123	116	138	165	129	132	140	126	1,661
Teso	32	28	35	46	35	42	39	59	54	52	59	113	594
Lango	21	25	27	81	9	72	18	27	24	27	109	313	753
TOTALS ..	216	211	224	236	167	230	195	251	207	211	308	552	3,008

Pneumonia.—165 cases were admitted of which 40 died. This is a slight increase over the figures for 1916 when 152 cases were admitted with 24 deaths.

Smallpox.—This has been already alluded to on page 11. Table E. below shows the large increase in Teso towards the end of the year so that 1918 opens inauspiciously, especially as we have no reliable lymph to check it. In 1917 the admissions were 992 with 230 deaths compared with 104 with 25 deaths in 1916. For the cases at Entebbe, Kampala and Jinja *see* Table A. on page 11. In addition to the figures given above 45 cases were treated in Military Hospitals with 10 deaths, 42 at Bombo and 3 at Entebbe.

Table F. below shows the number of deaths returned for the last 5 years.

TABLE E.—SHOWING THE CASES OF SMALLPOX MONTHLY, DURING THE YEAR IN TESO.

Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	TOTALS.
4	5	1	12	26	15	32	47	66	117	139	210	674

TABLE F.—SHOWS THE NUMBER OF DEATHS FROM SMALLPOX ACCORDING TO NATIVE RETURNS (AND RETURNS BY NATIVE INSPECTORS) DURING THE LAST FIVE YEARS.

DISTRICT	1917	1916	1915	1914	1913
Buganda	569	111	537	20	10
Busoga	1,199	334	210	870	317
Bukedi ...	1,527	1,537	815	353	...
Teso	674	54	370	142	...
Bunyoro	191	...	1	...	7
Toro	2	5	4	4	...
Ankole	16	77	4	1	3
Nile Districts and Lango..			*No*	*Returns.*	
TOTALS ...	4,178	2,118	1,941	1,390	337

90,128 Vaccinations were performed in 1917 compared with 30,621 in 1916 and in addition 13,723 military ones compared with 24,065 in 1916. For results, etc., *see* under Section III.

Syphilis.—The number of cases treated was practically the same as in 1916, 4,383 in 1917 and 4,636 in 1916. The special treatment rooms were closed throughout the year.

TABLE G.—SHOWING THE NUMBER OF DEATHS, ACCORDING TO NATIVE RETURNS FOR BUGANDA, BUSOGA, BUNYORO, ANKOLE AND TORO DURING THE LAST FIVE YEARS.

DISTRICT	1917	1916	1915	1914	1913
Buganda	760	603	413	427	561
Busoga	557	539	465	426	435
Bunyoro	84	148	230	595	591
Ankole	534	631	725	593	498
Toro	151	128	135	161	202
Eastern and Northern Provinces ...			*No*	*Returns.*	
TOTALS ...	2,086	2,049	1,968	2,202	2,287

Tuberculosis.—There were 15 cases with 4 deaths, an increase of 1 over 1916.

Yaws.—659 cases were treated during the year as compared with 720 in 1916.

3. HELMINTHIC DISEASES.

The number of cases recorded is almost the same as that for 1916.

Cestoda ...	1917 ...	85	1916 ...	85
Nematoda ...	,, ...	148	,, ...	151

(C) European Officials.

According to the returns sent in, there were 383 cases treated with 2 deaths but this does not include all the cases of illness as no returns were received from Fort Portal, Kabale, Kitgum, Mubendi and Arua. Of this number 359 were off duty.

In 1916 there were 480 cases with 1 death, 430 being placed off duty.

The 2 deaths were:— 1, from enteric of an officer in the Uganda Railway Marine and 1 from cerebral thrombosis.

Of the total admissions Malaria was responsible for 112, Dysentery 11, Enteric 1 and Relapsing fever 1. The remainder were diseases of Digestion and Respiratory organs and local injuries.

There were no cases of Blackwater Fever.

The following table shows the admissions under the three first named heads, as compared with the three preceding years and also the percentage which they formed of the total admissions:—

DISEASES.	1917		1916		1915		1914	
	Cases.	Percentage of total admissions.	Cases.	Percentage of total admissions.	Cases.	Percentage of total admissions.	Cases.	Percentage of total admissions.
Malaria	112	29·24	138	28·75	126	21·03	186	31·90
Dysentery	11	2·87	16	3·30	1	0·16	4	0·68
Enteric	1	0·26	1	0·21	5	0·83	12	2·06

(N.B.—The Blackwater Fever case does not appear in the admissions for 1917 but was invalided at the beginning of the year when convalescent).

Eight European Officials were invalided from the Protectorate during the year the causes being as given below:—

DISEASES.	1917.	1916.	1915.	1914.	1913.	Totals.
Blackwater Fever	1	1	—	1	1	4
Circulatory Affections	—	1	1	—	—	2
General Debility	1	1	—	—	—	2
Nervous and Mental Diseases ...	1	—	—	—	2	3
Neurasthenia	1	1	—	1	—	3
Tuberculosis	1	—	—	1	—	2
Leukæmia	—	—	—	1	—	1
Digestive	—	—	2	—	—	2
Carcinoma	1	—	—	—	—	1
Alcoholic Neuritis	1	—	—	—	—	1
Neuritis	1	—	—	—	—	1
TOTALS ...	8	4	3	4	3	22

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES OF EUROPEAN OFFICIALS DURING 1917.

STATIONS.	Total number of officials resident.	Average number resident.	Total number on sick list.	Total number of days on sick list.	Average daily number on sick list.	Percentage of sick to average number resident.	Average number of days on sick list for each patient.	Average sick time to each resident.	Total number invalided.	Percentage of invalidings to total residents.	Total Deaths.	Percentage of deaths to total residents.	Percentage of deaths to average number resident.	Number of cases of sickness contracted away from residence.
Bombo ...			No record											
Butiaba ...	5	2·00	8	13	0·03	1·5	1·6	6·50	Nil	—	Nil	—	—	—
Entebbe ...	108	47·89	157	528	1·45	3·0	3·3	11·02	5*	4·63	2	1·85	4·11	—
Gulu ...	17	3·27	9	61	0·16	4·9	6·8	18·60	Nil	—	Nil	—	—	6
Hoima ...	6	3·00	5	51	0·13	4·3	10·2	17·00	Nil	—	Nil	—	—	—
Jinja ...	50	10·00	44	40	0·10	1·0	0·9	4·00	1	2·00	Nil	—	—	16
Kampala ...	88	32·20	81	242	0·66	2·0	3·0	7·51	2	2·27	Nil	—	—	9
Lira ...	18	1·40	8	30	0·08	5·7	3·7	21·42	Nil	—	Nil	—	—	3
Masaka ...			Records incomplete											
Masindi ...	34	5·30	8	55	0·15	2·8	6·8	10·37	Nil	—	Nil	—	—	5
Mbale ...	29	3·48	5	96	0·26	7·4	19·2	27·58	Nil	—	Nil	—	—	2
Mbarara ...	11	3·57	4	6	0·01	0·2	1·5	1·67	Nil	—	Nil	—	—	—
Namasagali ...	5	4·00	8	21	0·06	1·5	2·6	5·25	Nil	—	Nil	—	—	—
Soroti ...	7	3·90	22	69	0·18	4·6	3·3	17·69	Nil	—	Nil	—	—	5
TOTALS ...	378	120·01	359	1,212	3·32	2·7	3·3	1·09	8	2·11	2	0·52	1·66	46

It will be seen that Mbale heads the list for "Average time sick for each resident" with 27·58 days followed by Lira (21·42), Gulu (18·60) and Soroti (17·69).

* Includes one Telegraphist who did not reside at Entebbe but who was always in the bush.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES OF ASIATIC AND NATIVE OFFICIALS DURING 1917.

STATIONS.	Total number of officials resident.	Average number resident.	Total number on sick list.	Total number of days on sick list.	Average daily number on sick list.	Percentage of sick to average number resident.	Average number of days on sick list for each patient.	Average sick time to each resident.	Total number invalided.	Percentage of invalidings to total residents.	Total Deaths.	Percentage of deaths to total residents.	Percentage of deaths to average number resident.	Number of cases of sickness contracted away from Station.
Bombo ...			No record											
Butiaba ...	8	7·00	45	40	0·10	1·43	0·88	5·70	Nil	—	Nil	—	—	—
Entebbe ...	95	67·00	127	524	1·43	2·13	4·12	7·82	3*	3·15	Nil	—	—	8
Gulu ...	8	4·80	7	22	0·06	1·20	3·14	4·60	Nil	—	Nil	—	—	1
Hoima ...	6	2·00	6	24	0·06	3·00	4·00	12·00	Nil	—	Nil	—	—	—
Jinja ...	123	67·00	171	513	1·40	2·09	3·00	7·65	Nil	—	2	1·62	2·98	10
Kampala ...	114	56·30	192	797	2·18	3·70	4·15	14·15	1†	0·87	1	0·87	1·77	—
Lira ...	6	2·39	13	70	0·19	7·90	5·38	25·10	Nil	—	Nil	—	—	3
Masaka ...			Records incomplete											
Masindi ...	34	10·10	18	206	0·56	5·50	11·44	20·39	1	2·94	1	2·94	9·90	11
Mbale ...	8	5·00	5	209	0·57	11·40	41·80	41·80	1	12·50	Nil	—	—	—
Mbarara ...	10	5·18	8	64	0·17	3·28	8·00	1·23	Nil	—	Nil	—	—	—
Namasagali ...	36	33·00	271	615	1·68	5·09	2·26	18·64	Nil	—	Nil	—	—	—
Soroti ...	9	2·76	39	91	0·25	9·06	2·33	32·95	Nil	—	Nil	—	—	15
Totals ...	457	262·53	902	3,175	8·69	3·31	3·52	12·09	6	1·31	4	0·87	1·52	48

Here again (as for Europeans) Mbale heads the list for "Average sick time for each resident" with 41·80 days followed by Soroti (32·95) and Lira (25·10).

* Includes 1 from Masaka.

† A Military clerk from Bombo.

(D) Native Officials including Asiatics.

There were 1,023 cases treated during the year with 4 deaths, figures almost the same as for 1916, 1,024 with 5 deaths. Several stations however sent in no returns, *see* under (*C*).

Of this number 902 were placed off duty, the chief cause was Malaria which accounted for 457 cases; four cases of Blackwater Fever occurred with 1 death.

Six Asiatic Officials were invalided during the year:—

4 for general debility, 1 combined with old age,
1 for hemiplegia and
1 for carcinoma.

One of these was a military clerk at Bombo (general debility and old age).

SECTION IV.

METEOROLOGY.

All available information under this head is embodied in the Blue Book.

SECTION V.

HOSPITALS AND DISPENSARIES.

Accommodation.

The hospital accommodation was as follows:—

Europeans.—There are two Government Hospitals for Europeans, one at Entebbe and one at Jinja. The Entebbe Hospital has four single-bed wards and one two-bed ward. At Jinja there is one single-bed ward and one three-bed ward, giving a total accommodation in the Protectorate of ten beds.

As Kampala has no Government European Hospital a motor ambulance is required for the removal of cases to the Hospital at Entebbe, until such time as a Hospital can be built. At present patients mostly go to the Church Missionary Society's Hospital at Namirembe; but if an ambulance was available cases could be removed to Entebbe almost as easily as under present circumstances to Namirembe.

A small European Hospital and a Nursing Sister, as at Jinja, are required at Masindi, and one at Mbale or Soroti.

Asiatics.—There is one Asiatic Hospital at Entebbe with three beds. Apart from this, patients are treated at their own homes or in the native hospitals.

The need for accommodation for Asiatic in-patients in several stations, especially Kampala and Jinja, is pressing, not only for ordinary diseases but also for infectious cases. The houses for Asiatic Officials are very small, many of two rooms only, and as many of them have large families it is impossible for them to get adequate treatment in their own homes and they naturally object to being put in a native ward.

Natives.—The accommodation for natives was as follows:—

	No. of beds.		*No. of beds.*
Entebbe, Civil	25	Jinja	20
Entebbe, Isolation	8	Masaka	6
Bombo	12	Masindi	8
Butiaba	3	Mbale	8
Gulu	6	Mbarara	7
Fort Portal	4	Namasagali	7
Hoima	8	Soroti	8
Kampala	26	Total	156

Infectious Hospitals and Segregation Camps.—There is no provision at all for European or Asiatic cases or contacts. At Entebbe the Native Isolation Hospital consists of an unlined corrugated iron building, in bad repair, with no fence of any kind round it. It is so hot in the day-time that patients object to being put in it and prefer to get relatives to come and build small grass huts for them. The contact camp is what was formerly the old Gaol and this too has no fence and it is thus impossible to keep either patients (unless too ill to move) or contacts properly segregated. The Isolation hospital staff consisted throughout the year of one ward boy one cook and two menial staff.

At Kampala there is no building of any kind for either infectious cases or contacts, except one room 12 feet by 12 feet, but there are two compounds fenced in with barbed wire, of 100 yards square, and two of 100 feet square. One of each of these really belongs to Entebbe but they had to be erected at Kampala when plague broke out there in 1916 and they have been in use ever since. The vote for up-keep has been insufficient to keep even the area enclosed in the fence clear of elephant grass, and recently a grass fire swept through the camp destroying all the huts. All the patients were rescued in time except one who unfortunately died from burns.

The Hospital buildings at Butiaba, Gulu, Fort Portal, Lira, Kitgum, Arua and Kabale are temporary only (wattle and daub with thatched roofs). Such buildings are unsatisfactory, whether for wards, dispensary or store, and it is hoped that they will be replaced as soon as possible by permanent ones of brick, with iron roofs.

The houses of the Medical Officers are only temporary ones of wattle and daub at the following stations:—Gulu, Lira, Soroti and Arua. That at Masindi is of sundried brick with thatched roof. It is hoped that permanent buildings will be erected as early as possible. Some of the stations have been occupied for many years, and in many cases the District Commissioner, and also the Assistant District Commissioner, have enjoyed permanent houses for years, yet the Medical Officers are still in temporary wattle and daub houses.

No returns have been received from Fort Portal, Kabale, Kitgum, Arua or Mubendi; the dispensaries having been either closed or in the charge of a native dresser only.

The Sleeping Sickness camp at Kyetume was throughout the year under the care of a native dresser. The figures for the year are as follows:—

Total in camp on January 1st.	*Admitted.*	*Total.*	*Died.*	*Discharged.*	*Remaining on 31st December.*
76	—	76	2	—	74

The treatment rooms for Venereal Diseases at Mulago (Kampala) remained closed throughout the year.

TABLE A.—THE FOLLOWING TABLE SHOWS, BY STATIONS, THE TOTAL NUMBER OF CASES TREATED, WITH DEATHS, AT GOVERNMENT HOSPITALS AND DISPENSARIES DURING THE YEARS 1917 AND 1916:—

STATIONS.	1917.		1916.	
	Total cases.	Deaths.	Total cases.	Deaths.
Bombo	4,627	27	5,710	6
Butiaba	1,418	29	1,208	1
Entebbe.—European Hospital ...	252	2	430	1
Civil Hospital	5,820	50	5,968	32
Fort Portal	—	—	—	—
Gulu	4,608	67	4,729	17
Hoima	5,657	221	6,448	2
Jinja—European Hospital... ...	162	1	159	—
Civil Hospital	3,310	62	5,440	121
Kampala.—Civil Hospital	12,312	324	11,409	290
Gaol	983	18	1,163	—
Kitgum	—	—	—	—
Lira	1,859	44	1,890	7
Masaka	4,651	10	8,421	18
Masindi	8,734	27	7,381	15
Mbale	3,573	26	3,368	27
Mbarara	5,820	29	3,625	1
Namasagali	2,789	11	2,921	1
Soroti	3,661	19	4,932	13
TOTALS ...	70,236	967	75,202	552

In addition to the above the following cases were treated at the Military Hospitals:—

	1917.		1916.	
	Cases.	*Deaths.*	*Cases.*	*Deaths.*
Entebbe ...	1,928	14	335	1
Bombo ...	6,739	143	7,078	32
Gulu ...	1,793	25	—	—

Buildings.

The following work was carried out during the year:—

Butiaba.—New Temporary Hospital erected.

Hoima.—Part of Hoima Gaol was converted into a Lunatic Asylum.

Minor repairs were carried out at Entebbe, Kampala, Bombo, Jinja and Namasagali.

The following buildings are required and should be provided as soon as financial considerations allow. Some of these have been alluded to already.

Entebbe.—*Fenced compounds for infectious cases and contacts.

*Permanent buildings for infectious cases and contacts, Europeans, Asiatics and Natives.

*New Headquarter Office or, failing that, three additional rooms, one for the P.M.O., one for the Deputy P.M.O. and one for the M.S.O.

Kampala.—*Permanent buildings for infectious cases and contacts, Europeans, Asiatics and Natives.

European Hospital, six beds.

Quarters for Nursing Sisters (two).

Asiatic Hospital, eight or ten beds.

Lunatic Asylum for Europeans, Asiatics and Natives.

House for Asylum Superintendent.

*New Office for M.O.H., Kampala. At present he shares a room 10′ × 10′ with the Sanitary Inspector and 3 Native Clerks.

*House for Bacteriologist }
*House for Laboratory Assistant } if Laboratory remains at Muyenga.

Jinja.— Asiatic Hospital, eight or ten beds.

*Permanent buildings for infectious cases and contacts, Asiatics and Natives.

House for Medical Officer of Health.

Masindi.— European Hospital, as at Jinja, and quarters for Sister (in same building).

Soroti.— European Hospital, as for Masindi.

Permanent houses for many Medical Officers at outstations.

Permanent buildings for Dispensaries, etc., at many outstations.

Those marked * are urgent.

SECTION VI.

SCIENTIFIC.

The following papers were published during the year:—

NOTES ON VALUE OF SALVARSAN IN RELAPSING FEVER AND MALARIA.—
By W. L. Peacock, M.B., ch.B., (Glas.)

NOTES ON ANTHRAX IN UGANDA.—
By B. Spearman, M.A., M.B., B.C., (Camb.) D.T.M.& H., (Camb.)

These are printed with this Report, *see* Appendices 5 and 7.

TABLE I.—RETURN SHOWING THE MEDICAL STAFF AND THE PRINCIPAL MEMBERS OF THE SUBORDINATE STAFF.

Name and Qualifications.	Rank of Appointment.	Where stationed on 31st December, 1917.		REMARKS.
A. D. P. Hodges, C.M.G., M.D. (Lond.), M.R.C.S., L.R.C.P. ..	Principal Medical Officer	Entebbe	*	
C. A. Wiggins, M.R.C.S., L.R.C.P., F.E.S.	Deputy P. M. O. ..	Do	*	
G. C. Strathairn, M.B., CH.B., D.P.H. (Edin.)	S. M. O. ..	Kampala	*	
R. A. L. van Someren, M.D., CH.B., D.P.H. (Edin.) ..	Do ..	Jinja		
Major G. Lane, R.A.M.C., (S.R.) L.R.C.S. AND P. (Edin.), L.F.P.S. (Glas.)	Medical Officer ..	Restored to active list		
J. H. Goodliffe, M.D., C.M. (Aberdeen)	Do ..	Bombo	*	
A. C. Rendle, B.A., M.D., B.C., D.P.H. (Camb.), M.R.C.S., L.R.C.P.	Do ..	On leave		
J. H. Reford, B.A., M.D., B.CH., B.A.O., L.M., (Dub.), D.T.M. (Liv.)	Do ..	On leave		
C. H. Marshall, M.R.C.S., L.R.C.P.	Do ..	On leave		
H. B. Owen, D.S.O., M.B., B.C., D.T.M. AND H. (Camb.) ..	Do ..	—	†	
L. Sells, L.R.C.P. (Edin.), L.S.A.	Do ..	Mbale		
J. A. Taylor, M.B., CH.B. (Edin.), L.M. (Dub.), D.T.M. (Liv.)	Do ..	Mbarara		
J. E. Hailstone, M.A., (Camb.), M.R.C.S., L.R.C.P. ..	Do ..	Soroti		
G. D. H. Carpenter, B.A., M.D., B.CH. (Oxf.), M.R.C.S., L.R.C.P.	Do ..	—	†	
R. E. McConnell, B.A., M.D., C.M. (Montreal), D.T.M. (Liv.)	Do ..	On leave		
B. Spearman, M.A., M.B., B.C., D.T.M. AND H. (Camb.) ..	Do ..	Entebbe	*	
A. H. Owen, M.R.C.S., L.R.C.P., D.T.M. AND H. (Camb.) ..	Do ..	—	†	
H. R. Neilson, M.B., CH.B. (Aberdeen)	Do ..	Gulu	*	
Major G. J. Keane, D.S.O., R.A.M.C., M.D., CH.B., D.T.M. (Liv.)	Temporary M. O. ..	—	†	
W. L. Webb, M.R.C.S., L.R.C.P.	Do ..	On leave		
N. S. Williams, B.A., M.R.C.S., L.R.C.P., B.C.	Do ..	On leave		
R. S. Taylor, B.A., M.B., B.C., M.R.C.S., L.R.C.P. ..	Do ..	Masindi		
W. L. Peacock, M.B., CH.B. (Glas.)	Do ..	—	†	
J. Currie, M.R.C.S., (Eng.), L.R.C.P. (Lond.), M.B., M.D. (U. Lond.)	Do ..	—	†	Seconded from Nigeria.
C. J. Baker, M.R.C.S., L.R.C.P.	M. S. O. ..	Entebbe		
J. M. Collyns, M.B., D.P.H. (Lond.), M.R.C.S., L.R.C.P. ..	M. O. H. ..	Kampala		
H. L. Duke, B.A., M.B., B.C., D.T.M. AND H. (Camb.) ..	Bacteriologist ..	--	†	
J. Stewart	Laboratory Assistant	On leave		
G. S. Bateman, L.D.S., R.C.S., (Eng.)	Dental Surgeon ..	On tour		
Miss B. Petherbridge	Matron ..	Entebbe	*	
Miss E. M. Pratt	Nursing Sister ..	Entebbe	*	
Miss A. B. Gordon	Do ..	On leave		
Miss D. K. Freear	Do ..	Jinja		
Mr. F. E. Westray	Dispenser ..	—	†	
Mr. J. D. Buckland	Do ..	On leave		(*en* route Butiaba to Coast)
Mr. H. Flint	Chief Clerk P. M. O.'s Office	Entebbe		
Mr. P. J. L. Waters	Assistant Clerk ..	Entebbe		
Mr. H. G. Blackman	Medical Storekeeper	On leave		
Mr. C. W. V. Gittins	Sleeping Sickness Inspector	On tour		

* On civil and military duty.   † On military duty.

TABLE I. (*a*)—RETURN SHEWING THE ASIATIC MEDICAL STAFF.

Name.	Rank.	Where stationed on 31st December, 1917.	REMARKS.
Thadani, B. T.	Assistant Surgeon	Entebbe	*
Gokal Chand	Sub-Assistant Surgeon	Namasagali ..	
Kanade, K. R.	,,	Mbarara	
Karkhanis, A. D. ..	,,	Jinja	
Achru Ram	,,	Kampala	*Seconded from I.S.M.D.
Hukam Singh	,,	Nairobi	†Seconded from I.S.M.D. Seconded to E.A.P. for military duty.
Barkatullah, M.	,,	.. ..	†Seconded from I.S.M.D. On leave.
Diwan Chand	,,	Soroti	Seconded from I.S.M.D.
Mukand Ram	,,	Mbale	
Bhatt, J. J.	,,	Bombo	Seconded from I.S.M.D.
Basant Singh	,,	Mwanza	†Seconded from I.S.M.D.
Ram Chand	,,	Mwanza	†
Nayar, H. C.	,,	Masindi	
Mangal Sain	,,	Gulu	
Maqbull Haqq	,,	Lira	
Andrews, C. P.	,,	Butiaba	
Das, B. P.	,,	.. ..	*En* route Butiaba to Entebbe proceeding on leave.
Karta Ram	,,	Entebbe	Seconded from E.A.P.
Ghulam Haider	Compounder	Hoima	
Faquir Chand	,,	Masaka	
Karm Dad	,,	Masaka	
Fernandes, E. F. X. ..	,,	.. ..	On leave.
Raval, R. K.	,,	Kampala	

* Civil and Military duty.   † On Military duty.

TABLE VIIA.—RETURN OF DISEASES (ALL CASES-BOTH IN AND OUT-PATIENTS) FOR THE YEAR 1917.

DISEASES.	Total.	Deaths.
Infective Diseases :—Beri-Beri	—	—
Cerebro-Spinal Fever	469	347
Chicken-Pox	32	—
Cholera	—	—
Dengue	6	—
Diphtheria	—	—
Dysentery	498	44
Endocarditis-infective	—	—
Enteric	11	4
Erysipelas	3	—
Gonorrhœa	1,645	2
Influenza	1	—
Kala Azar	—	—
Leprosy (*a*) Nodular	6	—
(*b*) Anaesthetic	4	—
Malaria (*a*) Tertian	6	—
(*b*) Quartan	—	—
(*c*) Aestivo-autumnual	4,315	6
(*d*) Chronic Malaria	93	—
(*e*) Blackwater	46	7
Measles	70	—
Malta Fever	1	1
Plague	171	143
Pneumonia	165	40
Rabies	—	—
Relapsing Fever	105	7
Rheumatic Fever	28	—
Septicæmia	1	1
Trypanosomiasis (Sleeping Sickness)	19	3
Small-pox	992	230
Syphilis (*a*) Primary	709	—
(*b*) Secondary	1,390	6
(*c*) Tertiary	1,780	10
(*d*) Inherited	504	—
Tetanus	1	—
Tuberculosis	15	4
Whooping Cough	22	1
Yaws	659	1
Yellow Fever	—	—
Pyrexia-Uncertain Origin	2,653	8
Mumps	23	—
Others	1	—
Intoxications	9	—
General Diseases	415	10
Nervous Diseases :—Sub-section 1	158	2
Sub-section 2	1,478	10
Sub-section 3	18	2
Diseases of the Eye	3,941	—
Diseases of the Ear	1,291	—
Diseases of the Nose	1,113	—
Diseases of the Circulatory System	114	5
Diseases of the Respiratory System	8,380	13
Diseases of the Digestive System	8,867	22
Diseases of the Lymphatic System	761	—
Diseases of the Urinary System	128	5
Diseases of the Generative System :—Male	1,006	4
Female	213	6
Diseases of the Organs of Locomotion	5,014	—
Diseases of the Connective Tissue	2,035	1
Diseases of the Skin	11,582	—
Injuries :—General	52	13
Local	6,667	8
Tumours	45	1
Malformations	—	—
Poisons	4	—
Snake bite	16	—
Parasites :—Animal	—	—
Protozoa	—	—
Trematoda	—	—
Cestoda	85	—
Nematoda	148	—
Insecta	112	—
Jiggers	140	—
TOTAL ...	70,236	967
SURGICAL OPERATIONS	2,296	—

TABLE VIIb.—RETURN OF DISEASES AT MILITARY HOSPITALS (ALL CASES—BOTH IN AND OUT-PATIENTS FOR THE YEAR 1917.)

DISEASES.	BOMBO.		ENTEBBE.		GULU.		TOTAL CASES.	TOTAL DEATHS.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Infective Diseases:—Beri-Beri	...	...	...	...	...	...	....	...
Cerebro-Spinal Fever	170	113	14	9	41	20	225	142
Chickenpox	78	...	13	...	...	...	91	...
Cholera	...	...	..	...	...	...	....	...
Dengue	...	...	...	...	...	...	....	...
Diphtheria	...	...	...	...	...	...	....	...
Dysentery	...	...	35	...	28	...	63	...
Endocarditis-infective	...	...	...	...	...	...	....	...
Enteric	...	...	...	...	...	...	....	...
Erysipelas	...	...	...	...	...	...	....	...
Gonorrhœa	197	...	96	...	58	...	351	...
Influenza	...	...	...	...	...	...	....	...
Kala Azar	...	...	...	...	...	...	....	...
Leprosy:—(*a*) Nodular	...	...	...	...	1	...	1	...
(*b*) Anaesthetic	...	...	...	...	...	...	....	...
Malaria:—(*a*) Tertian	...	...	...	...	...	...	....	...
(*b*) Quartan	...	...	...	...	...	...	....	...
(*c*) Aestivo autumnual	13	...	72	...	5	...	90	...
(*d*) Chronic Malaria	...	...	...	...	....	...	....	...
(*e*) Blackwater	...	...	...	...	....	...	....	...
Measles	109	...	9	...	4	...	122	...
Malta Fever	...	...	...	...	....	...	....	...
Plague	...	...	1	1	....	...	1	1
Pneumonia	52	15	9	2	8	2	69	19
Rabies	...	...	...	...	...	...	....	...
Relapsing Fever	...	...	1	...	...	...	1	...
Rheumatic Fever	...	...	...	...	...	...	....	...
Septicæmia	...	...	...	...	...	...	....	...
Trypanosomiasis (Sleeping Sickness)	...	...	...	...	...	...	....	...
Smallpox	42	8	3	2	...	...	45	10
Syphilis:—(*a*) Primary	134	...	27	...	2	....	195	...
(*b*) Secondary			12	...	8	....		
(*c*) Tertiary			6	...	5	....		
(*d*) Inherited			...	...	1	....		
Tetanus	...	...	...	...	...	....	....	...
Tuberculosis	...	...	...	...	...	....	....	...
Whooping Cough	...	...	...	...	...	....	....	...
Yaws	319	1	39	...	115	....	473	1
Yellow Fever	...	...	...	...	...	....	....	...
Pyrexia-Uncertain Origin	581	...	6	...	72	....	659	...
Mumps	...	...	...	...	...	....	....	...
Others	...	...	...	...	...	....	....	...
Intoxications	...	...	...	...	...	....	....	...
General Diseases	..	...	7	...	15	....	22	...
Nervous Diseases:—Sub-Section 1	11	...	...	...	1	....	12	...
Sub-Section 2	...	...	94	...	86	2	180	2
Sub-Section 3	...	...	...	...	...	....	....	...
Diseases of the Eye	175	...	37	...	44	....	256	...
Diseases of the Ear	66	...	23	...	20	....	109	...
Diseases of the Nose	6	...	133	...	6	....	145	...
Diseases of the Circulatory System	3	1	...	...	...	....	3	1
Diseases of the Respiratory System	677	...	93	...	138	1	908	1
Diseases of the Digestive System	285	5	353	...	172	....	810	5
Diseases of the Lymphatic System	152	...	51	...	20	....	223	...
Diseases of the Urinary System	...	...	...	...	2	....	2	...
Diseases of the Generative System:—								
Male	53	...	63	...	122	....	238	...
Female	...	...	...	...	...	....	....	...
Diseases of the Organs of Locomotion	393	...	106	...	311	....	810	...
Diseases of the Connective Tissue	1,516	...	53	...	74	....	1,643	...
Diseases of the Skin	695	...	304	...	180	....	1,179	...
Injuries:—General	...	...	...	...	...	....	....	...
Local	1,012	...	250	...	177	....	1,439	...
Tumours	...	...	3	...	...	....	3	...
Malformations	...	...	...	...	...	....	....	...
Poisons	...	...	...	..	...	....	....	...
Snake bite	...	...	...	...	...	....	....	...
Parasites:—Animal	...	...	...	...	...	....	....	...
Protozoa	...	...	...	...	...	....	....	...
Trematoda	...	...	...	..	...	....	....	...
Cestoda	...	...	...	...	...	....	....	...
Nematoda	...	...	10	...	74	....	84	...
Insecta	...	...	...	...	3	....	3	...
Jiggers	...	...	5	...	...	....	5	...
TOTALS	6,739	143	1,928	14	1,793	25	10,460	182

C. A. WIGGINS,
Acting Principal Medical Officer.

ANNUAL SANITARY REPORT

FOR THE YEAR ENDING 31st DECEMBER, 1917,

BY THE

MEDICAL SANITARY OFFICER.

Section III.

SANITATION.

(A) General Review of Work done.

1. ADMINISTRATIVE.

Tours of Inspection.—The Medical Sanitary Officer visited Kampala and Jinja on several occasions, as well as Masindi, Hoima, Butiaba, Mbale, Soroti, Masaka, Mjanji and Bombo.

Dr. Collyns, Medical Officer of Health, Kampala, made a tour through Western and Northern Buganda to investigate Smallpox outbreaks.

The European Sanitary Inspector for Kampala was absent on leave from April to the end of the year. As no European substitute was available a supernumerary Indian Inspector was engaged.

Town Planning.—The plans submitted for the Kololo Bazaar at Kampala were finally approved and the site marked out.

It was decided to reserve an area between (what will ultimately be) the European commercial quarter and the bazaar, for commercial (non-residential) plots for both Europeans and Asiatics.

So much dissatisfaction having been expressed by the trading community regarding the approved site for the Indian Bazaar at Jinja, on account of its distance from the pier, etc., a special Board was appointed to re-consider the matter, with the result that a new site has been approved, and is now being surveyed, which occupies a far more central position: while negotiations have been opened for the exchange of land belonging to the Church Missionary Society to provide for an Asiatic residential quarter. Both these sites conform to the principle of racial segregation.

Laws Passed, Etc.

Under The Infectious Diseases Ordinance.

The following places were declared infected :—

Iganga on account of Plague.
Hoima on account of Cerebro-Spinal Meningitis.
Nagongera and Kitgum on account of Smallpox.

Under The Prevention of Diseases (Cotton and other Trades) Ordinance, 1916.—

A series of rules were published prohibiting shipment of seed cotton on to vessels leaving Entebbe, Port Bell and Jinja: its off-loading at the Port of Entebbe and restricting the off-loading thereof at Port Bell and Jinja to that consigned from the ports of Mjanji and Bukakata respectively.

A series of rules have been drafted under the same Ordinance to regulate the construction of factory buildings and go-downs, the protection of machinery and disposal of waste material.

2. PREVENTIVE MEASURES.

MOSQUITO AND INSECT-BORNE DISEASES.

(A) Malaria.

1. *Petty Anti-Malarial Measures.*

The Anti-malarial Gangs have carried on the same measures for mosquito reduction as in former years.

2. *Major Anti-Malarial Measures—Swamp Drainage.*

The excessive rainfall during the last two years has increased the depth of all rivers and lakes. In some instances, *e.g.*, at Namasagali and Butiaba the high water has entirely obliterated former attempts at drainage, while at several places the excessive rainfall has hampered the maintenance of drainage work done in swamps.

The drainage of the swamp at Kampala has been made the subject of a special report, *vide* Appendix 4.

3. *Quinine Prophylaxis.*

148 lbs. of quinine were issued from the Headquarter Medical Store during the year, and 12,000 tablets, also 1,300 phials for intramuscular injection.

4. *Mosquito Protection of Quarters.*

Those already built have been maintained and the few European houses built during the year have been provided with gauze wire verandahs.

(B) Trypanosomiasis.

The areas cleared of fly jungle at ferries, ports and fords have been maintained.

It has been considered advisable to reduce the two-mile prohibited zone on the shores of Lake Victoria to a zone of about one mile in width, and a new boundary has been marked out.

(C) Spirillum Fever.

Fewer cases are recorded this year.

A portion of the permanent police lines have been built at Kampala, where for years the temporary lines had been tick infected.

Epidemic Diseases.

GENERAL.

Plague.

The 1916 epidemic at Kampala continued for the first half of the year in the town and district.

In 1917, 118 cases altogether with 105 deaths occurred. Of these 78 occurred in the town or on the hills immediately surrounding it.

Rat and human plague was for the first three months particularly persistent on Mengo and Namirembe hills, which are close to the township boundary.

The quarantine measures instituted in 1916 were continued, rat drives organised and inoculations performed on all contacts.

The outlying cases were sporadic and led to no serious local epidemic, though at one place 10 cases of pneumonic plague occurred.

There were only 8 cases of plague at Jinja, all isolated cases having no reference to each other. Rats were examined from time to time but all were negative as regards *B. pestis.*

Entebbe was attacked with plague in epidemic form. *Vide* Appendix 3.

At Iganga, in Busoga, there was an outbreak of rat and human plague which threatened to become serious, but the closing of the Indian Bazaar, inoculation of the population, and other measures very soon put an end to the trouble. The traffic in seed cotton between Bukedi and Iganga was the probable cause of the outbreak.

A small outbreak occurred in Gulu, in the Northern Province, introduced from Northern Lango. Nine people died. There was apparently no rat plague. Inoculation of the population of the town and a military recruiting depôt, together with the usual measures prevented the spread of the disease.

Cerebro-Spinal Meningitis.

Cerebro-Spinal Meningitis, as will be seen from the returns, has markedly increased throughout the Protectorate and repeated outbreaks have taken place at military depôts at Bombo, Entebbe and Kampala.

In my opinion the figures give an underestimate of the case as a great number of deaths from this disease have been recorded as plague in the native returns.

For instance, a number of deaths from plague have been recorded in Toro and Ankole where Cerebro-Spinal Meningitis is known to have occurred and where no case of plague has yet been diagnosed by a Medical Officer.

In Bunyoro plague was reported to be prevalent from August, 1916 onwards, but the diagnosis had never been confirmed by the microscope, and in January, 1917 during a tour through Bunyoro I saw several cases of Cerebro-Spinal Meningitis and from information gathered on the spot was convinced that all the cases previously reported as Plague were really Cerebro-Spinal Meningitis.

Though sporadic cases of the disease had occurred in previous years in various parts of the Protectorate it was unrecognised by the natives as a separate disease, and unnamed by them.

In order to obtain uniformity as regards native returns, prompt reporting of cases, and prompt action as regards quarantine measures, it was decided to introduce a native name for the disease. The name chosen as most etymologically correct is "MULALAMA", a Luganda word meaning 'stiff neck'.

The cause of the spread of the disease has undoubtedly been, primarily, the abnormal movements of natives due to (1) returning military porters from German East Africa, (2) The enormous number of recruits brought to Bombo and to a labour depôt at Mjanji (where 30,000 men were collected), a large percentage of these returning to their homes after rejection.

Another main factor in the distribution has been the masked nature of the disease among slight cases and 'carriers' who have established foci of infection in several parts of the country which have been unrecognised until a number of deaths occurred which led to suspicion of the cause.

There is no bacteriological equipment or staff which might be employed to pick out 'carriers' for segregation at the military depôts, and the district medical staff has been inadequate to deal with the disease in outlying districts. Therefore the preventive measures have been for the most part confined to isolation of cases and segregation of contacts carried out by chiefs through the administration, but, these measures in most instances, owing to the obscure nature of what is a new disease to the native, have been either omitted till too late or inadequately carried out.

At military depôts nasal douching of contacts was employed as a prophylactic with satisfactory results.

Smallpox.

The following (except for amended figures) has been already submitted as an interim report:—

Smallpox which has been steadily on the increase for the past few years has in 1917 assumed most serious proportions.

2. The rise in the sick rate has persisted in spite of preventive measures, which have been carried out as far as the available staff and material have allowed, and in spite of vaccinations on a large scale performed during the last few years, chiefly in the districts now most infected as will be seen from the following figures:—

Year.	*Smallpox (Deaths).*	*Vaccinations.*	*Year.*	*Smallpox (Deaths).*	*Vaccinations.*
1914	1,390	13,687	1916	2,118	54,686
1915	1,941	128,689	1917	5,170	103,851

3. The disease has had a wide distribution over the whole Protectorate except in the Western Province which has been very little affected.

4. It has been most prevalent in the Eastern Province (especially in Bukedi and in Eastern Busoga) and to a lesser extent in Bunyoro and Eastern and Central Buganda, particularly in the vicinity of Kampala.

5. Later reports show that the epidemic is on the wane in Bukedi but that it is now spreading in the Lango District.

6. There is no doubt that the high sick and death rate this year has been mainly caused by the abnormal movements among the native population due to extensive recruiting for troops and carriers, while the spread of the disease in the Kiagwe District (Eastern Buganda) has been assisted by labourers for the European plantations being drawn from infected districts in the Eastern Province.

7. Another most serious factor in the persistance of the epidemic is that the lymph from Nairobi with which the bulk of the vaccinations have been performed has to a great extent failed to confer immunity from attacks of the disease.

8. Several instances have occurred where smallpox has attacked (some with fatal results) those who recently have been "successfully" vaccinated. This has been particularly noticeable among military recruits in which case special opportunities for observation and technique exist.

9. The spread of the epidemic in Lango, a district hitherto practically unaffected by smallpox, where, owing to shortage of staff there is no resident Medical Officer and where the natives are less under control than in other districts, is alarming, because it is more difficult to enforce preventive regulations there; while to attempt to enforce universal vaccination with a lymph of doubtful value on a tribe which has shown exceptional opposition to inoculation against plague may have serious results.

Medical Officers in the infected areas have more than confirmed the above condemnation of the Nairobi Lymph in reports received subsequently; the general opinion being that the Lymph has conferred no immunity whatever. For instance, Dr. van Someren records 50 cases, 20 of which were fatal, in persons vaccinated under his direct observation within 12 months. Writing of the Nairobi lymph he states "it confers no protection nor does it modify the disease."

He and others have laid emphasis on the impression the failure of vaccination has had on the native mind, especially among hospital attendants, who have openly expressed their distrust in the prophylactic value of the lymph.

Recruits who have been rejected from Military Depôts at Bombo and elsewhere, and who were considered to be protected by vaccination, have been returned to their districts in large numbers, but these have subsequently contracted smallpox thus conveying the disease to their homes in all directions.

The prevalence of the disease in the neighbourhood of Kampala has thrown considerable extra work on the Kampala Medical Staff; the isolation camps being already occupied with Plague and Cerebro-Spinal Meningitis cases three special Smallpox camps had to be organised outside the town. In these cases were isolated and contacts segregated. Special medical police were provided as Guards in addition to Hospital Attendants.

Table of Vaccinations (Military and Civil.)

Lymph	Successful	Modified	Failed	Unknown	Totals	Number of known results	Percentage of successful (plus modified)
Lister	1,407	226	405	4,538	6,576	2,038	80·12
Nairobi Glycer ...	19,669	5,841	7,030	63,220	95,760	32,540	78·39
Arm to Arm	587	356	260	312	1,515	1,203	78·38
Totals ...	21,663	6,423	7,695	68,070	103,851	35,781	78·49

Total Military Vaccinations for 1917: 13,723.

Enteric Fever and Dysentery.

Prophylaxis with regard to these diseases have been confined to routine methods for Sewage disposal and protection of Water Supplies, except that a few anti-typhoid inoculations have been performed.

Helminthic Diseases.

There was an outbreak of Ankylostomiasis at Villa Maria Catholic Mission School, attributable to the use of a small bathing pool which has now been abandoned. Otherwise nothing noteworthy has been recorded.

Sewage and Rubbish Disposal.

Bucket latrines were established in the Lira Police Lines where the former pit latrines were dangerously near the water supply.

Incinerators for rubbish and improved pit latrines provided with smoke buckets were provided in the military lines at Bombo.

Water Supply.

Further improvements have been made to wells at Kampala and Mbale.

Drainage.

Masonry drains have been extended at Entebbe and Kampala.

(B.) Recommendations for future work.

1. The manufacture of an efficient lymph, with cold storage, at the Protectorate Laboratory.

2. The complete revision of the Infectious Diseases Ordinance and of the Sleeping Sickness Ordinances in order to obtain adequate powers in dealing with epidemics, etc.

3. Extension of the 'contour' pipe and rubble drains in the Kampala Swamp and the application of the principle of contour drainage to swamps at out-stations.

C. J. BAKER,
Medical Sanitary Officer.

TABLE IV.

Summary of Routine Sanitary Work done during the Year.

1. NAME OF TOWN—ENTEBBE.

—	Approximate Area.	Number of Proclaimed Open Spaces.
1915	12 square miles	13
1916	12 square miles	13
1917	12 square miles	13

2. POPULATION.

—	NUMBER OF ASIATICS.		NUMBER OF NATIVES.		NUMBER OF EUROPEANS.		TOTAL.
	Males.	Females.	Males.	Females.	Males.	Females.	
1915	198	81	2,647	2,060	84	44	5,114
1916	201	96	2,523	1,985	83	42	4,930
1917	213	84	2,341	1,835	68	40	4,581

3. HOUSING.

—	Number occupied by Europeans.	Number occupied by Natives and Asiatics, including boys' quarters.
Number of Houses :—		
1915	89	453
1916	89	453
1917	89	453

Number of huts :—

1915 1,180

1916 1,180

1917 1,160

4. MOSQUITO PROTECTION OF HOUSES.

	1915	1916	1917
Number of European houses wholly mosquito-protected	87	89	89
Number of European houses with mosquito room	20	20	21
Number rendered during the year wholly mosquito-protected	3	...	1
Number rendered during the year partially mosquito-protected	...	...	1

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1915	1916	1917
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	...	...	...
Number of houses erected with sanction as to site, construction, and relation to other buildings	4	...	...
Number of huts erected with sanction as to site, construction, and relation to other buildings	...	...	4
Number of houses built without sanction	...	...	...
Number of huts built without sanction	...	...	...

ACTION TAKEN.

—	NUMBER OF PROSECUTIONS.		NUMBER DEMOLISHED.	
	Huts.	Houses.	Huts.	Houses.
1915	...	...	43	...
1916	...	...	...	...
1917	...	..	...	...

6. MARKETS.

——	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	3	1	2
1916	3	1	2
1917	3	1	2

7. SLAUGHTER-HOUSES.

——	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	1	1	...
1916	1	1	...
1917	1	1	...

8. LATRINES.

——	FOR MALES.		FOR FEMALES.	
	Number.	Number of seats.	Number	Number of seats
Number of Public Latrines :—				
1915	13	51	...	...
1916	14	51	..	...
1917	14	42	...	...
Number of new Public Latrines erected during the year :—				
1915	1	3	...	...
1916	1	3	...	...
1917	...	..	...	...
Number of Public Latrines repaired during the year :—				
1915	4	...	...	...
1916	2	...	...	...
1917	...	...	...	...
Number of Public Latrines demolished during the year :—				
1915	...	...	...	...
1916	...	...	...	...
1917	...	9	...	...

	1915.	1916.	1917.
Number of Private Latrines	368	369	350
Average number of pails of nightsoil removed daily	428	430	392
Average number of soiled pails removed and clean pails substituted...	73	75	22
Number of nightsoil men employed to clean latrines and remove excreta	27	27	24
Number of cesspools	820	826	840
Number of cesspools cleansed	...	...	...
Number of new cesspools constructed during the year	...	...	428
Number of old cesspools abolished	87	89	412
Number of cesspools oiled regularly by Department	...	...	...

9. REMOVAL OF REFUSE.

	1915.	1916.	1917.
Number of dustbins	42	41	48
Number of carts at work daily to remove refuse from streets ...	12	10	10
Amount of refuse removed daily	48	46	40
Number of carts at work daily to remove refuse from yards and premises	Included	in above.	
Amount of refuse removed daily from yards and premises ...			
Number of men employed for removing refuse	10	12	10

10. MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

——	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1915.	1916.	1917.	1915.	1916.	1917.	1915.	1916.	1617.
Buried or trenched	210	208	200	40	42	32	1	1	1
Burnt	218	206	192	8	7	8	...	...	...
Thrown into sea	...	...	...	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	...	..	...	...

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1915.	1916.	1917.
1	1	1

12. WATER SUPPLY.

Nature of Water Supply.	1915.	1916.	1917.
PIPE-BORNE WATER :—			
Source (river, lake or spring) :—			
Number of linear yards...	...	...	...
Number of stand-pipes along roads...			
Number of stand-pipes in compounds and houses ...			
WELLS :—			
Public :—			
Number	25	25	25
Number with pumps protected against surface water and mosquito-protected	...	...	...
Private :—			
Number	1	1	1
Number protected against surface water and mosquito-protected	...	...	...
TANKS :—			
Public :—			
Number underground	....	....	....
Number mosquito-protected and served by pumps	....	....	....
Number above ground	....	....	....
Number mosquito-protected	....	....	....
Number of 400 gallons capacity or less	....	....	....
Number above 400 gallons	....	....	....
Private :—			
Number underground	1	1	2
Number mosquito-protected	1	1	2
Number above ground	178	179	180
Number mosquito-protected	1	1	1
Number of 400 gallons capacity or less	1	1	2
Number above 400 gallons	177	180	180
Nature of tank :—			
Wood	...	...	...
Iron	160	161	142
Concrete	18	19	40
Barrels :—			
Number	No	record	30
Number mosquito-protected	15	15	12

13. DRAINAGE.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of Masonry drains :—		
1915	2,079	413
1916	2,081	413
1917	2,131	582
Lineal yards re-constructed during the year :—		
1915	....	....
1916	....	....
1917	....	....
Lineal yards repaired during the year :—		
1915	....	....
1916	....	....
1917	70	....

13. DRAINAGE.—*continued.*

Nature of Drainage.	Public.	Private.
Lineal yards of new drains constructed during the year:—		
1915	717	....
1916	....	....
1917	50	169
Earth drains or ditches:—		
Number of linear yards of ditches cleaned:—		
1915	No record	No record
1916	No record	No record
1917	No record	No record
Number of linear yards of ditches dug and graded:—		
1915	No record	No record
1916	No record	No record
1917	No record	No record
Average frequency of clearing ditches of grass:—		
1915	1 monthly	1 monthly
1916	1 monthly	1 monthly
1917	1 monthly	1 monthly

14. CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

	1915.	1916.	1917.
Number of square yards of weeds, grass, and vegetation cut and removed	Approximately 3 and 9 miles		
Average frequency of clearance of rank vegetation on same area	Approximately 1 monthly		

15. EXCAVATIONS AND LOW-LYING LAND.

	1915.	1916.	1917.
Number of pools and excavations	8	8	10
Number of excavations filled up	3	4	4
Amount of low-lying and marsh land raised and drained	...	....	...
Number of pools, marshes, streams, &c., fish-stocked	...	....	....
Number of cubic yards of material used for filling up pools and excavations	...	....	....
Number of persons fined for making new excavations	....	....	....
Average number of men daily employed in filling up pools, &c.	10	10	10

16. OILING.

	1915.	1916.	1917.
Number of drains oiled	....	....	....
Number of pools and excavations oiled	2	3	3
Number of tanks and barrels oiled	....	....	....
Average number of men daily employed for oiling drains, pools, and water-tanks or barrels	1	1	1

17. INSPECTIONS AND PROSECUTIONS.

	1915.	1916.	1917.
Number of inspectors employed	1	1	1
Number of houses inspected	447	448	447
Number of houses where larvæ were found	35	38	7
Number of notices served to remove conditions causing the breeding of larvæ	13	14	4
Number of persons fined for having mosquito larvæ on premises	....	....	....
Number of notices served to remove insanitary conditions on premises	25	28	12
Number of persons fined for not removing insanitary conditions after notice	....	....	....
Number of soda and ærated water factories inspected	1	1	1

F. M. ISEMONGER,
District Commissioner.

TABLE IV.—*continued.*

Summary of Routine Sanitary Work done during the Year.

1. NAME OF TOWN—KAMPALA.

—	Approximate Area.	Number of Proclaimed Open Spaces.
1915	140,448 acres	8
1916	322,000 acres	8
1917	322,000 acres	8

2. POPULATION.

—	NUMBER OF NATIVES.		NUMBER OF EUROPEANS.		TOTAL.
	Males.	Females.	Males.	Females.	
1915	862	292	110	46	1,310
1916	993	533	105	44	1,675
1917	2,439	1,063	106	49	3,657

3. HOUSING.

—	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—		
1915	114	294
1916	116	296
1917	117	378
Number of huts :—		
1915		363
1916		571
1917		928

4. MOSQUITO PROTECTION OF HOUSES.

	1915	1916	1917
Number of European houses wholly mosquito-protected	77	80	83
Number of European houses with mosquito room	12	12	10
Number rendered during the year wholly mosquito-protected	6	3	3
Number rendered during the year partially mosquito-protected... ...	...	...	...

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1915	1916	1917
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	12	3	6
Number of houses erected with sanction as to site, construction, and relation to other buildings	24	23	20
Number of huts erected with sanction as to site, construction, and relation to other buildings	52	701	525
Number of houses built without sanction	...	...	...
Number of huts built without sanction	29	16	43

ACTION TAKEN.

—	NUMBER OF PROSECUTIONS.		NUMBER DEMOLISHED.	
	Huts.	Houses.	Huts.	Houses.
1915	...	...	99	18
1916	...	2	509	12
1917	...	..	*380	9

* Includes burning of old Police lines.

6. MARKETS.

	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	1	....	1
1916	2	....	2
1917	3	....	3

7. SLAUGHTER-HOUSES.

	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	1	1	...
1916	1	1	...
1917	1	1	...

8. LATRINES.

	FOR MALES.		FOR FEMALES.	
	Number.	Number of seats.	Number	Number of seats
Number of Public Latrines :—				
1915	13	56	2	14
1916	13	56	2	14
1917	13	56	2	14
Number of new Public Latrines erected during the year:—				
1915	1	7	1	7
1916	...	...	...	...
1917	...	..	...	...
Number of Public Latrines repaired during the year:—				
1915	2	7	...	...
1916	2	6	...	...
1917	*1	*6	...	...
Number of Public Latrines demolished during the year:—				
1915	...	...	...	...
1916	...	...	...	...
1917	...	...	...	...

	1915.	1916.	1917.
Number of Private Latrines	724	632	635
Average number of pails of nightsoil removed daily	794	702	709
Average number of soiled pails removed and clean pails substituted...	61	26	29
Number of nightsoil men employed to clean latrines and remove excreta	41	53	67
Number of cesspools	...	...	...
Number of cesspools cleansed	...	...	...
Number of new cesspools constructed during the year	...	...	...
Number of old cesspools abolished	...	...	...
Number of cesspools oiled regularly by Department	...	...	...

* Re-constructed to new design.

9. REMOVAL OF REFUSE.

	1915.	1916.	1917.
Number of dustbins	No record	No record	No record
Number of carts at work daily to remove refuse from streets ...	8	10	10
Amount of refuse removed daily—cartloads	34	52	55
Number of carts at work daily to remove refuse from yards and premises	8	10	10
Amount of refuse removed daily from yards and premises—cartloads...	17	20	22
Number of men employed for removing refuse	50	65	65

10. MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1915.	1916.	1917.	1915.	1916.	1917.	1915.	1916.	1617.
Buried or trenched	801	830	793	...	...	...	...	...	...
Burnt	...	...	...	32	50	53	2	2	2
Thrown into sea	...	...	...	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	...	. .	...	...

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1915.	1916.	1917.
2	2	2

12. WATER SUPPLY.

Nature of Water Supply.	1915.	1916.	1917.
PIPE-BORNE WATER :—			
Source (river, lake or spring) :—			
Number of linear yards...			
Number of stand-pipes along roads...	...	...	...
Number of stand-pipes in compounds and houses ...			
WELLS :—			
Public :—			
Number	5	5	6
Number with pumps protected against surface water and mosquito-protected	5	5	*5
Private :—			
Number	2	2	4
Number protected against surface water and mosquito-protected	2	2	†1
TANKS :—			
Public :—			
Number underground	....	....	....
Number mosquito-protected and served by pumps	....	....	....
Number above ground	....	....	....
Number mosquito-protected	....	....	....
Number of 400 gallons capacity or less	....	....	....
Number above 400 gallons	....	....	....
Private :—			
Number underground	6	9	9
Number mosquito-protected	6	9	9
Number above ground	110	115	209
Number mosquito-protected	105	110	193
Number of 400 gallons capacity or less	52	52	106
Number above 400 gallons	58	63	103
Nature of tank :—			
Wood	...	...	...
Iron	108	113	194
Concrete	8	11	15
Barrels :—			
Number	12	15	19
Number mosquito-protected	7	8	11

* Protected against surface water only. (No pumps). † Not Mosquito-protected.

13. DRAINAGE.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of Masonry drains :—		
1915	2,070	2,041
1916	3,412	2,751
1917	3,558	2,978
Lineal yards re-constructed during the year :—		
1915	....	107
1916	....	....
1917	....	....
Lineal yards repaired during the year :—		
1915	100	122
1916	....	85
1917	....	31

13. DRAINAGE.—*continued.*

Nature of Drainage.	Public.	Private.
Lineal yards of new drains constructed during the year :—		
1915	514	1,070
1916	1,342	710
1917	146	226
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1915	5,128	No record
1916	3,786	No record
1917	3,329	No record
Number of linear yards of ditches dug and graded :—		
1915	500	No record
1916	1,397	No record
1917	877	No record
Average frequency of clearing ditches of grass :—		
1915	8	No record
1916	8	No record
1917	8	No record

14. CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

	1915.	1916.	1917.
Number of square yards of weeds, grass, and vegetation cut and removed	792,877	877,015	904,000
Average frequency of clearance of rank vegetation on same area	6 times	7 times	8 times

15. EXCAVATIONS AND LOW-LYING LAND.

	1915.	1916.	1917.
Number of pools and excavations	307	No record	No record
Number of excavations filled up	No record	No record	No record
Amount of low-lying and marsh land raised and drained	275,332 sq. feet	154,600 sq. feet	685,000 sq. feet
Number of pools, marshes, streams, &c., fish-stocked	...	....	....
Number of cubic yards of material used for filling up pools and excavations	Impossible to gauge	....	(18,000 feet in one area on Kololo)
Number of persons fined for making new excavations	...	.. .	....
Average number of men daily employed in filling up pools, &c.	...	....	....

16. OILING.

	1915.	1916.	1917.
Number of drains oiled	....	....	....
Number of pools and excavations oiled	307	....	....
Number of tanks and barrels oiled	....	....	....
Average number of men daily employed for oiling drains, pools, and water-tanks or barrels	6	...	....

17. INSPECTIONS AND PROSECUTIONS.

	1915.	1916.	1917.
Number of inspectors employed	2	2	2
Number of houses inspected	665	702	721
Number of houses where larvæ were found	580	1,486	1,674
Number of notices served to remove conditions causing the breeding of larvæ	108	24	8
Number of persons fined for having mosquito larvæ on premises	....	3	3
Number of notices served to remove insanitary conditions on premises	135	87	92
Number of persons fined for not removing insanitary conditions after notice	....	7	8
Number of soda and ærated water factories inspected	2	2	2

In connection with drainage of low-lying ground, the following figures show the new work done during the year on the Kampala Swamp :—

Open drains	14,436 feet.
Drain piped and rubbled	2,166 feet.
Drains rubbled	221 feet.

J. M. COLLYNS,

Medical Officer of Health,

for Executive Officer, Kampala Sanitary Board.

TABLE IV.—*continued.*

Summary of Routine Sanitary Work done during the Year.

1. NAME OF TOWN—JINJA.

—	Approximate Area.	Number of Proclaimed Open Spaces.
1915	2560 (4 square miles)	5 Tennis Courts (European, Goan and Indian)
1916	do	do
1917	do	do

2. POPULATION.

—	NUMBER OF NATIVES INCLUDING ASIATICS.		NUMBER OF EUROPEANS.		TOTAL.
	Males.	Females.	Males.	Females.	
1915	1,800	1,100	40	14	2,954
1916	2,205	1,560	34	16	3,815
1917	1,870	1,467	29	13	3,379

3. HOUSING.

—	Number occupied by Europeans.	Number occupied by Asiatics and Natives.
Number of Houses :—		
1915	48	175
1916	48	175
1917	48	256

Number of huts :—	
1915	1,000 Approximately.
1916	1,255 do
1917	1,216 do

4. MOSQUITO PROTECTION OF HOUSES.

	1915	1916	1917
Number of European houses wholly mosquito-protected	29	29	29
Number of European houses with mosquito room	...	...	...
Number rendered during the year wholly mosquito-protected	...	...	...
Number rendered during the year partially mosquito-protected... ...	...	...	...

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1915	1916	1917
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	...	...	...
Number of houses erected with sanction as to site, construction, and relation to other buildings	2	1	1
Number of huts erected with sanction as to site, construction, and relation to other buildings	20	1	...
Number of houses built without sanction	...	...	...
Number of huts built without sanction	300	350	...

ACTION TAKEN.

—	NUMBER OF PROSECUTIONS.		NUMBER DEMOLISHED.	
	Huts.	Houses.	Huts.	Houses.
1915	...	...	270	...
1916	...	1	95	1
1917	...	..	39	1

6. MARKETS.

——	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	1	...	1
1916	1	...	1
1917	1	...	1

7. SLAUGHTER-HOUSES.

——	Total Number.	Number Paved and Drained.	Number Unpaved.
1915	1	1	...
1916	1	1	...
1917	1	1	...

8. LATRINES.

——	FOR MALES.		FOR FEMALES.	
	Number.	Number of seats.	Number	Number of seats
Number of Public Latrines :—				
1915	20	...	...	...
1916	20	...	...	...
1917	18	...	...	...
Number of new Public Latrines erected during the year :—				
1915	4	...	...	...
1916	...	...	...	...
1917	...	..	...	...
Number of Public Latrines repaired during the year :—				
1915	...	...	...	...
1916	3	6	...	...
1917	6	7	...	...
Number of Public Latrines demolished during the year :—				
1915	...	...	...	...
1916	...	...	...	...
1917	2	4	...	...

	1915.	1916.	1917.
Number of Private Latrines	216	216	227
Average number of pails of nightsoil removed daily	400	400	411
Average number of soiled pails removed and clean pails substituted...	...	...	...
Number of nightsoil men employed to clean latrines and remove excreta	20	20	22
Number of cesspools	13	13	2
Number of cesspools cleansed	...	...	...
Number of new cesspools constructed during the year	...	...	...
Number of old cesspools abolished	...	...	11
Number of cesspools oiled regularly by Department	...	...	...

9. REMOVAL OF REFUSE.

	1915.	1916.	1917.
Number of dustbins	1	1	11
Number of carts at work daily to remove refuse from streets ...	..	...	...
Amount of refuse removed daily	...	...	...
Number of carts at work daily to remove refuse from yards and premises	4	4	4
Amount of refuse removed daily from yards and premises ...	22	22	22
Number of men employed for removing refuse	27	27	27

10. MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

——	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1915.	1916.	1917.	1915.	1916.	1917.	1915.	1916.	1617.
Buried or trenched	...	...	...	22	...	...	...	...	...
Burnt	...	400	411	...	22	22	1	1	1
Thrown into sea	...	...	...	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	...	. .	...	...

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1915.	1916.	1917.
1	1	1

12. WATER SUPPLY.

Nature of Water Supply.	1915.	1916.	1917.
PIPE-BORNE WATER :—			
Source (river, lake or spring) :—			
Number of linear yards...	...	...	...
Number of stand-pipes along roads...			
Number of stand-pipes in compounds and houses ...			
WELLS :—			
Public :—			
Number	...	...	...
Number with pumps protected against surface water and mosquito-protected	...	...	...
Private :—			
Number	...	...	...
Number protected against surface water and mosquito-protected	...	...	...
TANKS :—			
Public :—			
Number underground	....	....	....
Number mosquito-protected and served by pumps	....	....	....
Number above ground	....	....	....
Number mosquito-protected	....	....	....
Number of 400 gallons capacity or less	....	....	....
Number above 400 gallons	....	....	....
Private :—			
Number underground	...	...	...
Number mosquito-protected	...	...	...
Number above ground	40	40	40
Number mosquito-protected	40	40	40
Number of 400 gallons capacity or less	38	38	38
Number above 400 gallons	2	2	2
Nature of tank :—			
Wood	...	...	...
Iron	33	33	33
Concrete	7	7	7
Barrels :—			
Number	...	...	...
Number mosquito-protected	...	...	...

13. DRAINAGE.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of Masonry drains :—		
1915	...	...
1916	..	...
1917	...	...
Lineal yards re-constructed during the year :—		
1915	....	....
1916	....	....
1917	....	....
Lineal yards repaired during the year :—		
1915	...	...
1916	...	...
1917	...	...

13. DRAINAGE.—*continued.*

Nature of Drainage.	Public.	Private.
Lineal yards of new drains constructed during the year :—		
1915	...	...
1916	...	...
1917	...	...
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1915	...	...
1916	...	...
1917	...	...
Number of linear yards of ditches dug and graded :—		
1915	...	...
1916	600 yards	...
1917	...	...
Average frequency of clearing ditches of grass :—		
1915	Every month	...
1916		
1917		

14. CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

	1915.	1916.	1917.
Number of square yards of weeds, grass, and vegetation cut and removed	...	...	...
Average frequency of clearance of rank vegetation on same area	...	...	...

15. EXCAVATIONS AND LOW-LYING LAND.

	1915.	1916.	1917.
Number of pools and excavations	...	...	...
Number of excavations filled up	...	...	...
Amount of low-lying and marsh land raised and drained	...	...	...
Number of pools, marshes, streams, &c., fish-stocked	...	...	...
Number of cubic yards of material used for filling up pools and excavations	...	...	...
Number of persons fined for making new excavations	...	...	...
Average number of men daily employed in filling up pools, &c.	...	...	...

16. OILING.

	1915.	1916.	1917.
Number of drains oiled	....	....	....
Number of pools and excavations oiled	....	10	10
Number of tanks and barrels oiled	....	....	....
Average number of men daily employed for oiling drains, pools, and water-tanks or barrels	....	7	7

17. INSPECTIONS AND PROSECUTIONS.

	1915.	1916.	1917.
Number of inspectors employed	1	1	1
Number of houses inspected	223	223	245
Number of houses where larvæ were found	31	12	10
Number of notices served to remove conditions causing the breeding of larvæ	31	5	6
Number of persons fined for having mosquito larvæ on premises	13	...	...
Number of notices served to remove insanitary conditions on premises	121	54	53
Number of persons fined for not removing insanitary conditions after notice	19	11	...
Number of soda and ærated water factories inspected	1	1	1

G. P. V. JERVOISE,
District Commissioner.

List of Appendices.

1. Annual Report of the Government Dental Surgeon—
By G. Stanley Bateman.

2. Annual Report on Enteric Fever during the year—
By C. A. Wiggins, *Acting Principal Medical Officer.*

3. Plague in Entebbe—
By C. J. Baker, *Medical Sanitary Officer.*

4. Report on Drainage of Kampala Swamp—
By C. J. Baker, *Medical Sanitary Officer.*

5. Notes on value of Salvarsan in Relapsing Fever and Malaria—
By W. L. Peacock, *Medical Officer.*

6. A Case of Spirillum Fever in (German) East Africa—
By J. H. Reford, *Medical Officer* and H. L. Duke, *Bacteriologist.*

7. A Note on Anthrax in Uganda—
By B. Spearman, *Medical Officer.*

8. Notes on Intra-venous Injections of Tincture of Iodine in Plague—
By Achru Ram, *Sub-Assistant Surgeon.*

APPENDIX I.

Annual Report, 1917.

Government Dental Surgeon.

Out-stations Visited.	*No. of Visits.*
Kampala	9
Jinja	3
Masindi	2
Mbale	1
Soroti	1
Lira	1
Masaka	1
Mbarara	1
Lutobo	1
Toro	1
Mubendi	1
Butiaba	1

Number of patients attended	280
Number of visits of patients	437
Number of artificial dentures made	11
Number of repairs, etc., to dentures	14

G. STANLEY BATEMAN,
Government Dental Surgeon.

APPENDIX II.

Report on Enteric Fever in Uganda for 1917.

The total number of cases reported during 1917 was 11 as against 15 in 1916 and 20 in 1915. Of the 11 cases 4 were fatal.

2. Three of the cases were Europeans, one, an Officer of the Uganda Marine contracted it on board one of the Lake Steamers, came in to Entebbe Hospital and died there; one was a non-official who contracted it on the steamer between Durban and Mombasa on his return from leave and who was treated at Jinja; and the 3rd was the wife of an official who was stationed at Gulu (of the Paratyphoid B. group.)

3. The other cases were Natives and were scattered having no apparent relation to each other: Jinja 5, Entebbe 1, Soroti 1 and Mbale 1. The Soroti case was in a King's African Rifles' askari and the disease was probably contracted outside the Protectorate.

4. In addition to the above, the Church Missionary Society had two suspected cases, both natives, in their hospitals but the diagnosis was not confirmed.

5. Very few inoculations were done during the year among the civil population, but the inoculation of all recruits for the African Native Medical Corps and the East African Mechanical Transport Corps before proceeding to Dar-es-Salaam, was instituted in November, 1917, and over 100 were done in November and December.

C. A. WIGGINS,
Acting Principal Medical Officer.

APPENDIX III.

Plague in Entebbe, 1917.

In January a man (a native) came from Kampala and died a few days after of pneumonic plague. Shortly after this two cases (both natives) of bubonic plague occurred in which the source of infection was not traced.

There was no further manifestation of the disease until the end of July when a number of rats were found dead of plague in and around a building occupied by Indian artizans.

After a short interval bubonic plague attacked a native servant of these Indians and two natives who had been employed in whitewashing the building.

On September 3rd rats dead of plague were found in large numbers in and around a Goanese bakery and adjoining Indian shops in the town. The next human case occurred in a native hut 500 yards away a week later.

On September 10th dead plague rats were reported in Kitabe bazaar which is a mile away from the town, and from that date human plague cases continued to appear frequently both in the town and Kitabe bazaar, as well as in the surrounding native shambas, until the end of October, after which three cases only occurred and no infected rats were found. The last case was on November 26th.

Altogether 36 cases occurred of which 3 recovered. 17 cases were of the pneumonic type, 2 septicæmic and 17 bubonic. 7 of the pneumonic cases were attacked after admission to the contact camp.

No European was attacked though more than one European's servant died.

One K.A.R. recruit died of plague but no other cases of human plague and no rat plague occurred in the Military lines.

Preventive Measures Taken.

1. All cases were isolated and all contacts segregated for 10 days.

2. As the Indian shops became infected those of the poorer class in the town and also all those in the Kitabe bazaar were evacuated for three weeks and all grain and food-stuffs removed from them.

3. All infected huts burnt and houses disinfected and the more dilapidated Indian quarters were pulled down or renovated with addition of cement floors, etc. The expense of the latter was borne by the owners without opposition.

4. Steps were taken with the help of the Police and the local chiefs and headmen to prevent natives visiting other native huts and also servants quarters in the town.

5. Inoculation with Haffkines Prophylactic was performed on 7,757 persons, of whom 1,500 were Military.

6. *Rat Destruction.*—Traps and poison were used with little effect, but rat drives were instituted with good results. All available labour was employed while the epidemic proceeded for two hours daily in gangs of 10—12, armed with sticks and accompanied by two men with hoes with which to dig out the nests. Bags of 30—200 were obtained in this way and altogether 4,782 rats were destroyed. By the end of November the rat population had perceptibly diminished and rats killed and examined since that date have shown no *bacilli pestis.*

It has been arranged that fortnightly drives should be continued.

In these drives five distinct species of rats were killed.

(*a*) The most common one a bristly haired brown rat with hairy ears—tail shorter than body. Found in houses, huts and in grass or sweet potatoes. These were found also dead of plague.

(*b*) A dark brown rat with very short tail $\frac{1}{3}$ length of body. Very few seen—not found in huts—not found infected.

(*c*) A bright, yellowish brown, fairly large rat with white belly, tail slightly shorter than body—not found in houses—common in sweet potatoes—not found infected.

(*d*) Back greyish brown. Grey belly with buff hairs on flanks—tail shorter than body—ears hairless. Found in huts and fields—also found dead of plague.

(*e*) Long grey rat—tail longer than body—not very numerous—only found in huts and houses. Not found infected but was driven out of an infected hut when burnt.

Specimens of the above rats were sent to the Pretoria Museum and a report on them has been received giving the names as follows :—

(*a*) *Dasymus orthos.*
(*b*) *Otymys irroratus.*
(*c*) *Gerbiliscus bohmi.*
(*d*) *Epimus Spec ?*
(*e*) *Mus rattus.*

Etiology.

There was no evidence to show how the infection, except perhaps for the first case, originated.

A few cases occurred in May about 12 miles from Entebbe but there does not appear to have been any connection with these and the outbreak of rat plague in July.

In carrying out the preventive measures enumerated above the services of the following deserve commendation :—

Captain J. A. Taylor, U.M.S. (M.O. Entebbe).
Mr. E. D. Tongue, A.D.C.
Mr. B. T. Thadani, Assistant Surgeon.
Mr. Wazir Singh, Sanitary Inspector.

C. J. BAKER,
Medical Sanitary Officer.

APPENDIX IV.

Report on the Drainage of Kampala Swamp, 1917.

Hitherto the system of drainage adopted consisted in keeping the main stream cleared and deepened throughout the valley of the Nakivubu, together with all its tributaries, and keeping as much of the low lying ground, thus partially drained, cultivated as far as possible and intersected with small open earth ditches.

It has, however, been found impossible, with the available funds and labour, to keep these open ditches adequately clear of vegetation; and in some of the low lying portions of the swamp, the number of ditches necessary to drain the land, if laid on the most economical herring-bone plan, has proved to be enormous.

Contour surface drainage had been advocated years ago to relieve this condition, and last year I proposed that it would be worth while to experiment with subsoil " tile " drainage, but for various reasons nothing could be done.

This year, however, thanks to the interest and energy displayed by Mr. J.D. Milner, the Executive Engineer in charge of the Public Works at Kampala a combination of these two principles has been applied to a portion of the swamp with excellent results.

After experiments with various mixtures of local clay, it was found that a satisfactory porous "tile" drain pipe about twelve inches long with a bore of 3″ diameter could be turned out at a cost of Rs. 80/- per 1,000 and 800 of these were completed by the end of May.

All round the edge of the swamp where the porous soil of the rising ground meets the impervious swamp clay, is a continuous chain of " seepage holes " or springs.

These "seepage holes" were marked with flags, and a line chosen for the contour drain on the rising ground, more or less parallel to the seepage line.

PLATE I.

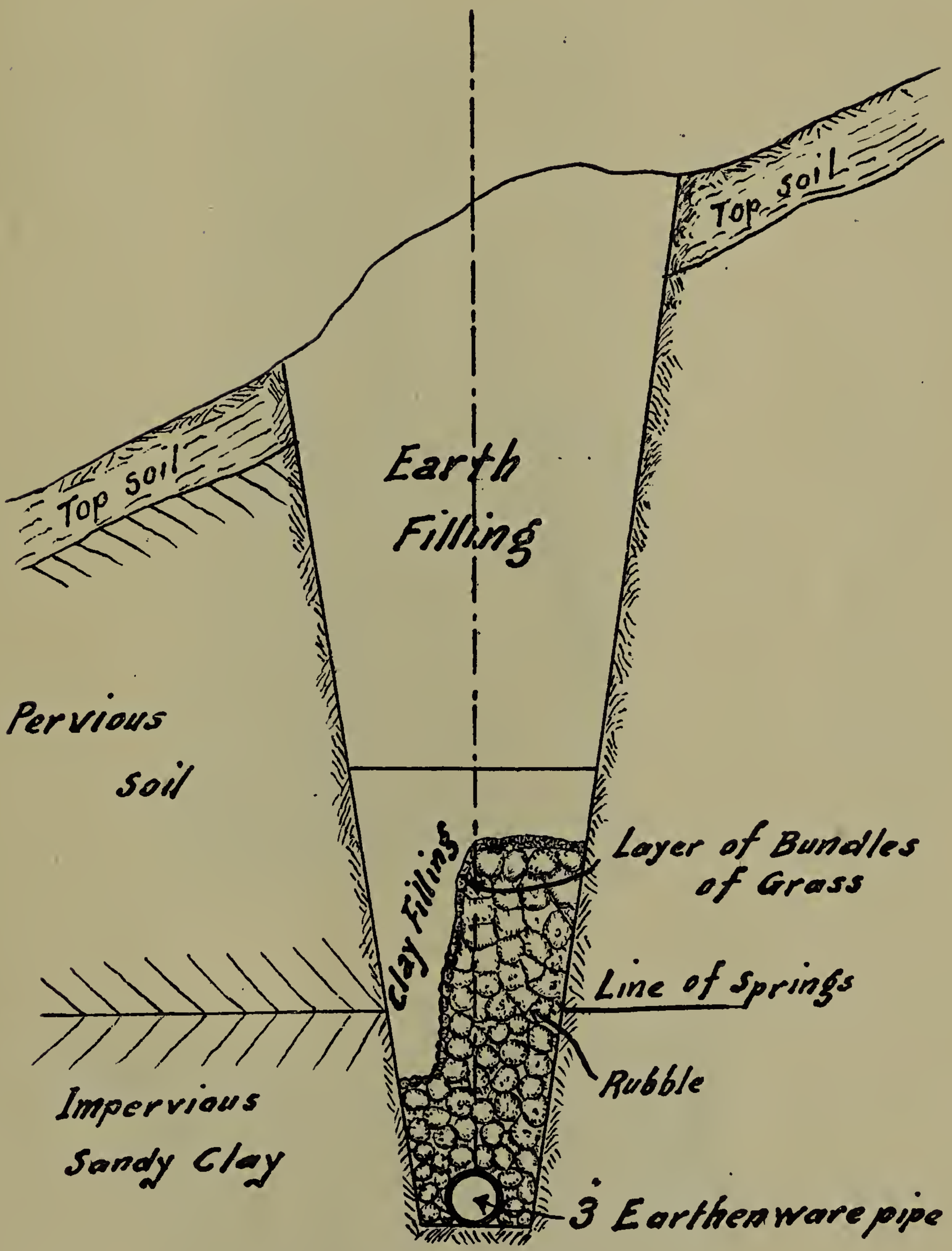
P.W.D. KAMPALA

Swamp Drainage

Type Section of Contour Drain

Scale 1/12

Diagram of Section of Pipe and Rubble Drain.

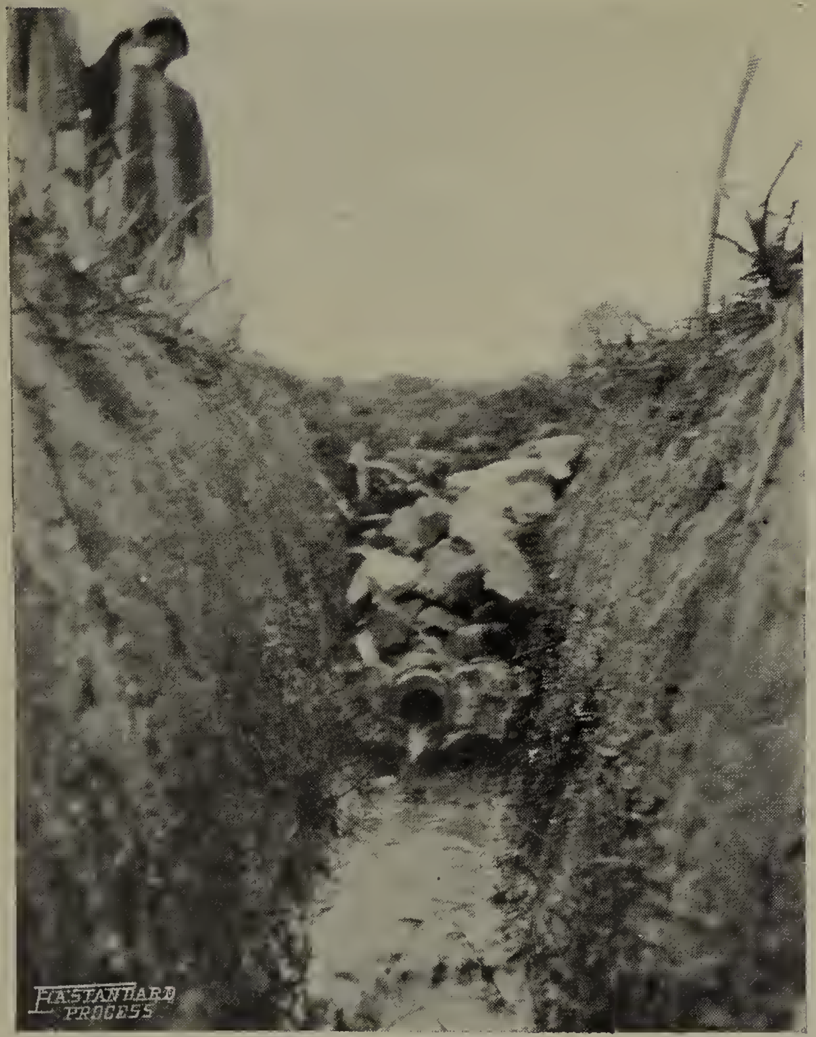


N.B.—"Line of Springs" indicates lowest level of sub-soil water lying superficial to impermeable clay.

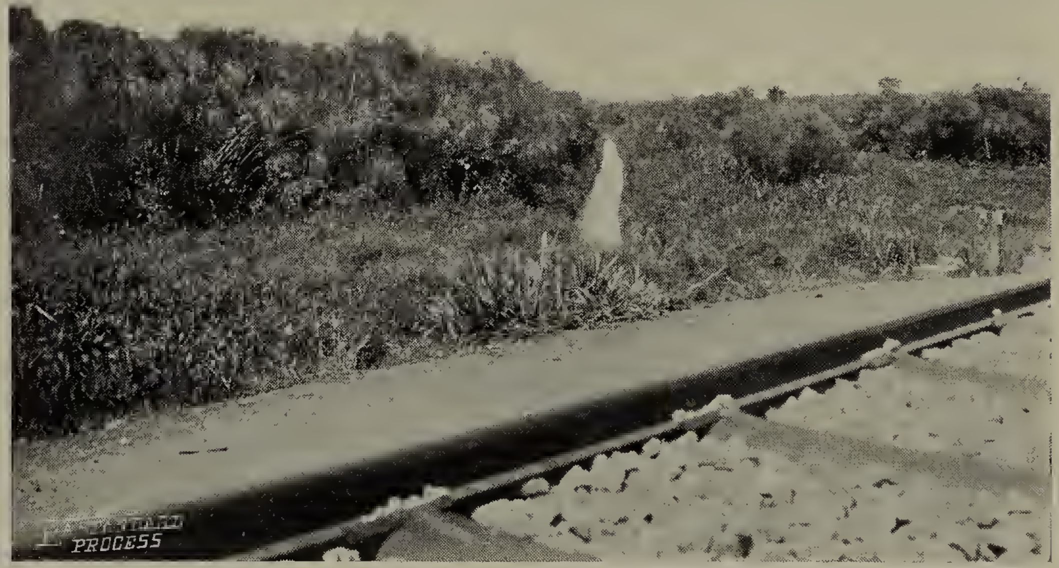
NOTE Joints to be Covered with Clay Collar

LONDON SCHOOL OF
LIBRARY

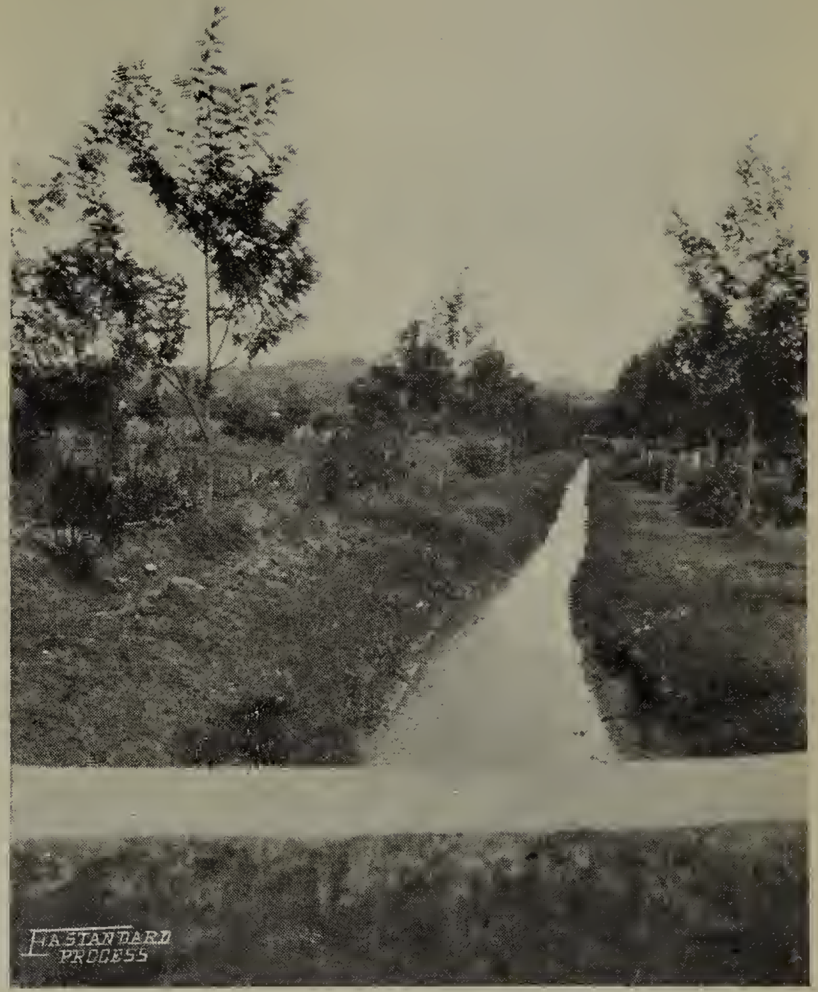
PLATE II.



Pipe and Rubble Drain under construction.

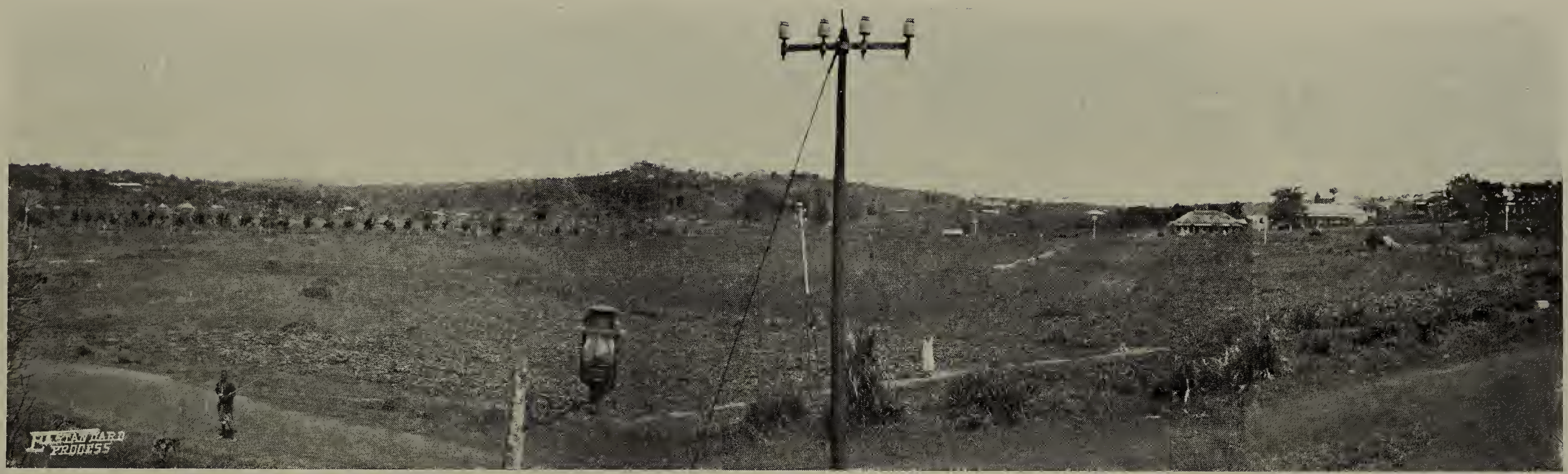


The Nakivubo Stream deepened and graded to form main drainage channel through Swamp—after rain.



View from Railway Bridge at lower end of valley showing portion of main channel cut through virgin swamp.

PLATE III.



Portion of former swamp land treated by about 500 feet of Pipe and Rubble Contour Drain and planted with sweet potatoes.
The native dressed in white in the foreground is standing on the filled in drain.
The line of trees on the left shews position of Nakivubo Stream.

The strata met with in cutting the drain were :—

(*a*) Top soil or humus about 6″ deep.
(*b*) One to four feet of red porous earth.
(*c*) The impervious sandy clay.

Between (*b*) and (*c*) the subsoil water finds its way eventually to the seepage holes.

After comparing the available literature on the subject describing the system adopted in Panama and the Malay States, it was decided to make use of rubble as well as pipes; constructing the drains as follows :—

(1) Cut drain to line, and grade with a bottom of 9″ in width and a side batter as steep as the nature of the soil permits; the invert being approximately one foot below the level of springs.

(2) Lay the 3″ tiles carefully in invert, the tiles being trued up to line, butt jointed, and the joints surrounded with puddled clay.

(3) Pack broken stone carefully around pipe until it is completely covered with 3″ of stone.

(4) Pack rubble 9″ wide to a height of 9″ above the level of springs, cover with grass, fill in trench with clay to a height of 6″ above the rubble, and fill remainder of trench to the surface with any soil convenient.

(5) Drains to be laid in straight lines between points which can be located by pockets in which the rubble is filled to the surface.

Outlets to the pipe drain were arranged about every 250 feet or so, varying according to the position of existing drains (such as roadside drains), or at the best points for making connecting drains with the main channel.

848 lineal feet of drain were completed as above, which soon had a marked influence on the portion of the swamp concerned.

To demonstrate the actual result, the water collected in the pipe was gauged at the outlets.

On July 31st after an exceptionally dry month, (rainfall only ·22 inch) the reading showed that the water collected in these 848 feet of pipe amounted to a flow of 16·85 gallons per minute, or 24,264 gallons in 24 hours. It will be seen that this large volume of water is thus rapidly and effectively carried to the main channel which otherwise would have to be dealt with by means of numerous small open surface drains. Subsequent gaugings have shown that the water collected in the pipes is not much affected by rainy weather and the flow is more or less constant.

The total cost of the above 848 feet of drain, and 490 feet of open outlet drain was Rs. 808/34.

The experiment having proved successful, the pipe and the rubble contour drains have been extended to a length of 2,166 lineal feet up to the end of the year, with a total of 1,434 feet of connecting open drains; with the result that a very large number of the existing open drains have been rendered unnecessary, and though some of these have been retained for inspection purposes, more than 1,000 lineal feet have been filled in.

In places short lengths of drains have been filled in with rubble only, and the results have been quite satisfactory.

Besides the above, the usual work of clearing and deepening the main channels was continued throughout the year, and the swamp land cultivated as far as possible.

C. J. BAKER,
Medical Sanitary Officer.

APPENDIX V.

Note on the Value of Salvarsan in Relapsing Fever and Malaria.

In the circular accompanying the original packages of Salvarsan, claim is laid to the curative effect of that drug in cases of relapsing fever and of malaria. This statement is repeated in most of the text books on tropical medicine to which I have had access.

I regret to say, that in practice, the results claimed are not in accordance with the effect obtained.

During the latter part of 1916, a large number of Indians among the Infantry, stationed at Mwanza, German East Africa, suffered from relapsing fever—a severe type of which is very prevalent here.

In conjunction with Lieut. Roche, I.M.S., I gave Salvarsan intravenously to some twelve cases. These were given in all stages of the disease. Some in the apyretic period and others on the second or third day of the fever. In every case Lieut. Roche was able to demonstrate the presence of the parasite in from six to fifteen days later. Similar results were obtained with African patients.

In the case of one of my personal boys—Ali—, 0·5 grm. was administered on the second day of the initial attack. The reaction was extremely pronounced. Severe headache and profuse sweating followed an hour after the injection and acute pain was complained of in the region of the spleen, the latter swelling up to about six times its normal size during the next three days. Parasites could not be demonstrated in the blood, but an erratic fever followed which persisted for three weeks, after which the pain and swelling disappeared leaving the patient much prostrated.

The drug was given in all cases intravenously and in doses varying from 0·1 to 0·5 grms.

As regards the effects in malaria, two cases have come under my personal observation.

In the first case, a Hindu who was accidentally infected with Syphilis in the finger, was given a full dose of Salvarsan (0·6 grms.). The usual reaction followed about an hour later, but fever persisting on the second day, a blood examination was made and malarial parasites in the form of young rings were found.

In the second case, a European suffering from early Secondary Syphilis, was given his second dose of 0·5 grms. Salvarsan ten weeks after the first.

The reaction was mild but thirty-six hours later, severe headache, blood-stained vomiting and joint pain ensued.

A blood examination showed numerous malarial parasites apparently of about 24 hours growth. Symptoms rapidly disappeared with an injection of quinine.

In both of these cases the parasite was of the subtertian variety. I have had no opportunity of observing the effect in cases of Benign or Quartan fever.

The following conclusions are I think, legitimate :—

(1) Salvarsan is useless in relapsing fever at any rate in single doses. Possibly if given on the first day of the fever, some result might be obtained but the severity of the reaction renders great caution imperative and it is doubtful whether it would not be preferable to endure the fever.

(2) In malignant malaria, if anything, Salvarsan has a stimulating effect, certainly it is no cure.

W. L. PEACOCK, *Captain, U.M.S.,*
Medical Officer, Mwanza.

APPENDIX VI.

A CASE OF SPIRILLUM FEVER
IN
(GERMAN) EAST AFRICA

BY

MAJOR J. H. REFORD, U.M.S., M.D., B.A.O., B.CH., D.T.M.,
O.C. Advanced Base Hospital, Mwanza.

and

CAPTAIN H. L. DUKE, U.M.S., M.D., B.C., D.T.M. & H.,
Bacteriologist, Uganda Protectorate.

History.—The patient, Captain M., a strongly built good constitutioned man of 28 years was taken ill towards the end of July, while on "safari," a few days out of Mwanza, German East Africa, and compelled to return. He was admitted to hospital on August 2nd under the diagnosis of measles. The attack was typical and somewhat severe, koplik spots, fever, coryza and rash being all in evidence. The day before reaching Mwanza he was badly bitten during the night by Spirillum ticks, (*Orninithodorus moubata*), a large number of which were found in his bedding on the following morning. He was bitten a number of times during this night (1st—2nd August), probably by a considerable number of ticks.

Progress of case.—On his admission to hospital the fever and other symptoms of the measles soon subsided, as is shown in the attached temperature chart. On the 11th the temperature began to rise again, and on the 12th *spirochætes* were found in the peripheral blood. No malaria could be demonstrated. The first spell of fever lasted four days, the temperature reaching 105·8 F. On August 14th quinine was started in doses of 20 grains daily, reduced on 18/8 to 10 grains a day which was continued until his transfer to Entebbe Base Hospital on 22nd August.

Isolated rises of temperature occurred on 18th, 23rd and 27th of August reaching respectively 101·4, 102·5 and 103·9, the temperature in the intervals being generally subnormal. It may be remarked here that patient says his temperature during health in Uganda is generally subnormal. On August 30th, the 29th day after admission to hospital, another spell of fever commenced with at first daily and then alternate daily intermissions to subnormal levels, and on September 5th a blood examination revealed sub-tertian malaria—a condition suggested by the diurnal periodicity of the fever. Quinine was re-commenced in doses of 20 grains daily, dropping to grains 10 daily on September 12th, and an immediate fall of temperature ensued. No *spirilla* were seen on this occasion.

The next spirillum relapse began on September 18th, the 48th day after admission, and on the following day the temperature rose to 105·2, falling to subnormal the next day. *Spirochætes* were again found in the peripheral blood.

In the eleven days interval between the elimination of the malaria and this last relapse of the spirillum, the patient felt in excellent health and spirits though he was easily tired; he ate and slept well, and took mild exercise in the cool of the evenings. On the 23rd September he was discharged from hospital, but was kept under observation for 3 weeks, at the end of which time it was deemed safe to return him to duty. He remained in excellent health until November 5th when he was re-admitted to Mwanza hospital with *pyrexia*, 96 days after his first admission. On the following day *spirochætes* were found and no malaria, though the blood was taken and examined on two occasions. The *spirochætes* were scarce in these slides. On the 18th November he was discharged from hospital but kept under observation for 14 days.

No further fever troubled him until December 12th when he was re-admitted to hospital, and *spirochætes* were again found on the 14th December, the 135th day after his first admission. Diarrhœa appeared for the first time during this relapse.

On 2nd January, 1917, while on tour in the neighbourhood of Mwanza he was attacked with diarrhœa, his companion Captain W. showing the same symptoms simultaneously. Both officers had drunk some doubtful water on the previous evening. One of us, who had not seen Captain M. since diagnosing the relapse of November 5th and was ignorant of the intervening medical history, was with the expedition and, at first, as the temperature of both officers remained normal, treatment was commenced on purgative and antiseptic lines. Captain W. recovered in a day or so, but on January 15th Captain M's temperature rose above normal and on the 8th reached 101·5, the diarrhœa persisting. Two different blood examinations on 7th January, 1917 proved negative to both malaria and spirillum, though a slight relative large *mononuclear leucocytosis* was observed. Quinine was administered in doses of 20 grains daily, and the diarrhœa subsided together with the temperature. The patient was much weakened by the attack and was sent back to Mwanza. Again ensued a spell of *apyrexia*, which lasted until 28th of January; during this period the patient was under medical observation and doing light duty. Then on January 28th he was re-admitted to Mwanza hospital, and that night the temperature rose to 103·3, reaching 105·5 on January 31st. On the 28th *spirochætes* were again found in the blood Yet another relapse occurred on February 10th, the 194th day after his first admission, when *spirochætes* were once again found. A search for malaria on 12th February proved negative. The patient was then invalided to Europe.

Remarks.—The onset of the spirillum fever commenced on August 11th, 10 days after the infection by the ticks. The high temperature on September 1st may certainly be ascribed to the *spirochætes* and constitutes the first definite relapse, complicated by malaria.

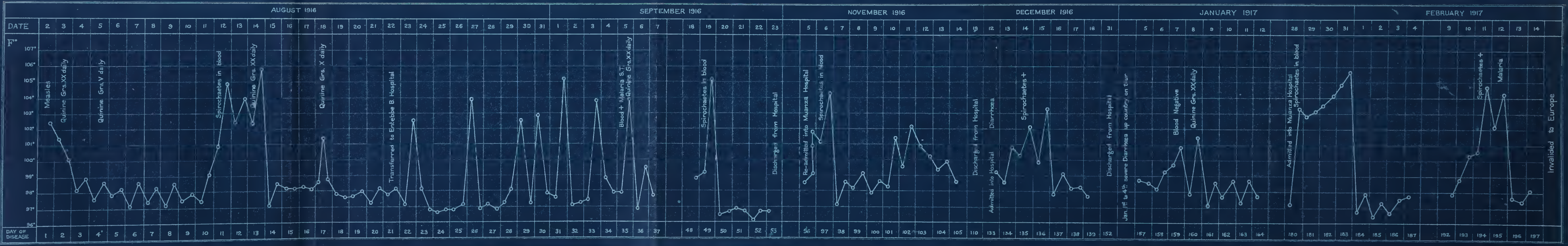
The rises occurring during the interval between these two spirillum manifestations are curiously irregular. Only subtertian malaria was found, but it is possible that another type was also present, as the tertian parasite is common in the Mwanza district and the quartan organism is also reported in the German records.

It is probable however that a partially suppressed relapse of the spirillum fever was represented by the *pyrexia* of 23rd August. This date corresponded to the period at which the first relapse was expected, and it is not uncommon in our experience to find one or other of the relapses partially or completely suppressed, or to fail in finding *spirochætes* in the peripheral blood even in some of the well defined relapses.

The 2nd relapse was well defined and occurred after an interval of 11 days of subnormal temperature.

The real interest of the case now commences. Between the 2nd and 3rd definite relapses there was a period of 46 days *apyrexia*, during which time the patient was in excellent form and experienced neither subjective nor objective symptoms. Then came the 3rd relapse, of a slightly irregular character, terminating we will say on November 16th, and followed, after a 25 days interval, by the 4th relapse of a milder nature than its predecessors. After another interval of 19 days, the 6th *pyrexial* period commenced, accompanied by diarrhœa. On this occasion blood examination failed to reveal *spirochætes*, but it is highly probable that this attack represents the 5th definite relapse. Except for the diarrhœa this was the milder of all the manifestations. Seventeen days later *spirochætes* were again found in the blood, the temperature during this 6th relapse reaching 105·5 F. *Spirochætes* were once again found after a further interval of 9 days, this constituting the 7th definite relapse, occurring 193 days after the patient's first admission and some 195 days from the date of his actual infection by the ticks. After his admission into hospital on August 8th, 1916, the patient was not exposed to any chance of re-infection by ticks.

The exigencies of active service precluded any consultation of the current literature of spirillum fever, but the case is, undoubtedly a remarkable one. The long period of *apyrexia* between relapses 2 and 3 during the greater part of which the patient was going about his duties unconscious of any inconvenience whatever; the absence throughout of any signs of iritis or facial paralysis which are such common complications in European spirillum cases in Uganda; the relative absence of headache during the fever spells; the coincident infections, first measles and then malaria; the diarrhœa, present only during relapses 4 and 5; the regularity and relative ease with which the *spirilla* were found, even in the later relapses; the number of relapses and the exceptionally prolonged duration of the infection—all these features will, we hope, justify the publication of the case.


AUGUST 1916
SEPTEMBER 1916
NOVEMBER 1916
DECEMBER 1916
JANUARY 1917
FEBRUARY 1917
DATE
F°
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
96°
DAY OF DISEASE
Measles
Quinine Grs.XX daily
Quinine Grs.V daily
Spirochaetes in blood
Quinine Grs. XX daily
Quinine Grs. X daily
Transferred to Entebbe B. Hospital
Blood + Malaria S.T.
Quinine Grs.XX daily
Spirochaetes in blood
Discharged from Hospital
Re-admitted into Muanza Hospital
Spirochaetes in blood
Discharged from Hospital
Admitted into Hospital
Diarrhoea
Spirochaetes +
Discharged from Hospital
Jan. 1st to 4th severe Diarrhoea up country on tour
Blood Negative
Quinine Grs. XX daily
Admitted into Muanza Hospital
Spirochaetes in blood
Spirochaetes +
Malaria
Invalided to Europe

LIBRARY

It is possible that the lowering of general resistance produced by the initial attack of measles enabled the *spirochætes* to establish themselves unusually firmly in the system, a similar effect being produced by the superimposed malarial attack during the first relapse. Considering the number of ticks seen at the original infection, the patient may well have received several strains of *spirochætes*. The bad water drunk a few days before the 5th relapse may have caused the diarrhœa, with consequent lowering of resistance and recrudescence of the spirilla, or, the diarrhœa itself may have been a manifestation of the disease.

In each case where *spirochætes* were found in the blood, stained slides were examined, and, except in the single instance of the first relapse, malarial organisms were absent on each occasion. The administration of quinine, even when no malarial parasites were found, was carried out as shown on the chart, as it was at times impossible, owing to pressure of work, to undertake the prolonged examination of the slides necessary to finally exclude all malarial elements.

The treatment for the spirillum fever itself was mainly symptomatic, with protection of the eyes, and maintaining the resistance as far as possible against relapses. The use of Salvarsan was not resorted to in this case, as the results of our recent experience of this drug in several cases of Spirillum at Mwanza Hospital have been so unsatisfactory that we have discontinued its use in Relapsing Fever.

J. HOPE REFORD, *Major, U.M.S.,*
O.C. Advanced Base Hospital, Mwanza.

H. L. DUKE, *Captain, U.M.S.,*
Bacteriologist, Uganda Protectorate.

APPENDIX VII.

Anthrax in Uganda.

An adult male Swahili, a lamp cleaner on the Busoga Railway, taken ill four days previously with shivering fits and pain in chest, appeared acutely ill when admitted to hospital. Respiration was rapid, cough constant, and expectoration free; pulse 120, respirations 40, temperature 102° F.

There was marked deficiency in resonance over the whole of the left lung, with diminished air entry and tactile vocal fremitus, numerous moist rales throughout the left side of chest, with jerky "cogwheel" inspirations, and a few crepitations scattered throughout the right lung. The apex beat was ill defined and the heart sounds muffled. Clinically the case presented a typical picture of acute pulmonary tuberculosis, but in view of the existing plague epidemic the possibility of pneumonic plague had to be considered. Microscopical examination of the sputum for tubercle and plague bacilli showed that both were absent, but anthrax bacilli, with marked granular staining, were found to be numerous.

The patient was isolated. He died on the evening of the sixth day after admission, after about ten days' illness.

Post-mortem Examination.

There was a considerable quantity of straw-coloured fluid in the pericardium and a small amount in the pleural cavity. The left lung was extremely congested and œdematous, with patches of grey hepatization, which in parts had broken down into small caseating masses. Except for a small amount of congestion and œdema, the right lung was normal. The trachea was congested and the bronchial glands considerably enlarged. Films taken from the broken-down patches in the left lung showed anthrax bacilli. The liver and kidneys were somewhat congested; the spleen was enlarged and congested; no bacilli were found in a smear from the spleen.

The case is noteworthy for its rarity. It is, I think, the first case reported in the Protectorate. The man stated that he never came into contact with cattle or hides. Considering the large numbers of cattle and the extensive trade in hides, it is surprising that cases do not occur more frequently.

B. SPEARMAN, M.A., M.B., B.C., Cantab.
Jinja, Uganda Protectorate.

REPLY TO CRITICISMS BY DR. F. W. EURICHS ON THE ABOVE.

1. RARITY. This is the first case I personally have seen and the first that has been reported in the Protectorate. If common among cattle herding natives I think they would have recognised the disease and had a native name for it.

2. DURATION. The man died on the evening of the 6th day and gave a history of three or four days' illness previous to admission.

3. On the "alleged" discovery of anthrax bacilli in the lungs the whole case and the interest in it rests. These bacilli were seen not only by myself but also by Dr. van Someren, Senior Medical Officer, Jinja and Dr. Baker, Medical Sanitary Officer, Uganda Protectorate, and we all agreed that they were anthrax bacilli and for this reason the disease was diagnosed as anthrax and not acute pulmonary tuberculosis or pneumonic plague. Dr. Eurichs also remarks later that it is unfortunate no cultures were made. In this I quite agree, but owing to lack of facilities this was impossible.

4. The man's death was reported to me by the Indian Sub-Assistant Surgeon as having occurred the previous night. As he made no statement as to the terminal collapse of the patient, I omitted any mention of it in my communication.

5. The bronchial glands were enlarged and NOT infiltrated with blood.

6. No gelatinous deposit was noted but there was excess of straw-coloured rapidly coagulating fluid in the pericardium, pleura and also anterior mediastinum.

7. Anthrax bacilli were found in the broken-down patches and the sputum and the surface of the congested left lung.

8. Finally I would point out that the case cropped up in the midst of a severe plague epidemic with both bubonic and pneumonic types. On seeing the man for the first time I naturally concluded that he almost certainly had pneumonic plague and I seldom remember seeing anything more striking than the finding of the "alleged" anthrax bacilli when we confidently expected to see plague bacilli and if they were absent, one was equally confident of finding T. B.

9. That the case was inadequately reported I am aware, but must plead in excuse great pressure of work in the midst of an epidemic and lack of facilities for proper bacteriological methods.

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APPENDIX VIII.

Notes on Intra-Venous Injections of Tincture of Iodine in Plague.

During the Plague epidemic at Kampala from September, 1916 to September, 1917, 356 cases of plague were reported with 36 recoveries.

Out of these 356 cases, the different types were :—

Septicæmic.	Bubonic.	Pneumonic.
196	148	12

SEPTICÆMIC TYPE.

Out of 196 cases 187 were dead bodies brought by the porters employed on plague duties. Only 9 cases were admitted to Isolation Camps and 8 of these had their finger blood positive for *B. Pestis.*

Three cases who were clinically very bad with high fever and delirium recovered after four Iodine injections described hereafter; one case whose diagnosis was not confirmed microscopically but had symptoms like Septicæmic type, recovered without Iodine.

Four cases, admitted in a far advanced stage of the disease, died before any Iodine could be administered.

One case, admitted on the 3rd day of disease, died after one Iodine injection.

BUBONIC TYPE.

Out of 148 cases, there were 54 dead bodies brought by porters.

Out of the remaining 94 cases treated, there were 32 recoveries and many of these were given intra-venous injections of Tincture of Iodine.

In 1916 the record of the cases treated by Iodine was not very accurately kept.

The following are the figures of the cases treated with Tincture of Iodine in 1917.

> During 1917 the total number of plague cases was 118 with 105 deaths. Out of these 118 cases 97 were dead bodies brought by porters. Of these 13 cases who were cured, 10 were of Bubonic type and 3 of Septicæmic type: of these 13, 9 were treated with Iodine intra-venous injections.

In 1917, 15 cases were treated with Tincture of Iodine injections and 9 recovered, 3 being Septicæmic type among the recoveries.

Of the 6 who died there were 5 Bubonic cases and 1 Septicæmic, No. 1 (of these 6 deaths) was admitted in a far advanced stage of the disease and received only 1 injection and died on the same day. Nos. 2 and 3 (of these 6 deaths) were Indians and were apparently cured of plague, but died suddenly, apparently of heart failure, one on the 10th day following an attack of Asthma, and the other as a result of walking about too soon. No. 4 (of these 6 deaths) a native, was of a Bubonic type and after his 4th Iodine injection, when apparently recovering, died. No. 5 (of these 6 deaths) a native, of Septicæmic, improved at first after 4 Iodine injections but relapsed and died on 7th day of disease after a 5th Iodine injection. No. 6 (of 6 deaths) a Bubonic type had been ill 3 days before admission, received 3 injections of Iodine. He died on the 2nd day after admission.

PNEUMONIC TYPE.

12 cases, all dead bodies brought by porters.

The method employed at the beginning of the epidemic was dilute Tincture of Iodine and latterly I used the B. P. Tincture in the manner described below:—

Methods employed:—

Dilute method Tincture Iodine ...	m 8
Sterilised water	dr 1

injected into a vein, usually the median basilic, twice the first day and Tincture Iodine (m 6) with sterilised water (dr 1) twice the 2nd day.

After the first few cases I stopped the dilution and used Tincture Iodine (m 8) slowly injected t~~hr~~wice 1st day.

Tincture of Iodine (m 6) slowly injected t~~hr~~wice 2nd day.

Tincture of Iodine in small doses by the mouth (1—3 minims t.d.s. in 1 oz of water) was given, if the temperature was not yet normal.

Most of these cases, who recovered under this treatment, were those who were seen very early on the first or second day of the disease; cases admitted after the second day did not generally improve under the Iodine treatment. 3 cases of Septicæmic type shown as cured were admitted on the first day of the disease.

I was struck with clearing of the head symptoms after the Iodine. A few cases were rather restless an hour or two after the Iodine injection.

Glands were found enlarged in majority of the cases in the Femoral region but some had anterior axillary glands enlarged and some had the upper cervical. One case whose finger blood was positive for *B. pestis* had a small gland in the axilla and a large inflamed *supra trochlear* gland at the elbow.

The diagnosis in cases alive on admission was confirmed by microscopical examination of blood or gland smears.

Dead bodies were examined for glandular enlargements, if there were none a spleen smear was taken, if this proved negative a lung smear was examined.

Leishman's stain was generally used.

Some cases required strict administration of stimulants after Iodine injections.

I regret that the pressure of extra work entailed by this serious epidemic and by a rush of military patients from Mwanza rendered it impossible to keep more than very rare records of these cases in 1916. But I submit that this method of treatment is well worth a further trial in view of the results obtained by it in 1917.

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7th April, 1918.

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